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HOW TO SUCCEED IN COLLEGE

HOW TO SUCCEED IN COLLEGE

BY
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PREFACE

For the past four years the author has been making an investigation of student capacities and their methods of work. In this investigation, the attempt was made to isolate some of the more important factors which determine academic and personal success among college students; also to determine what adjustments college students are making to the more basic elements in a successful college and life career. Simultaneously with these investigations various plans have been tried to help college students improve, not only their methods of work, but their attitude and point of view.

For the same reasons that we do not expect or require a prospective physician or lawyer to master unaided the knowledge and skill which pertains to his chosen profession, we should not expect college and high school students to learn by sheer experience and by the trial and error method—employed by the race to make its slow and laborious advancements in every field—how to conserve their energy and time, or how to use both most effectively when confronted by their tasks. We should not expect them to learn unaided

how to make the right use of ideals or specific purposes and plans, how to make an effective analysis of their tasks in order to find the best ways of performing them, how to master the higher phases of the art of reading or even how to make the conditions under which they must live and work most helpful for the things which they have to do.

In these and many other respects ambitious young people may be helped so that they can learn how to work at their tasks in a more effective way than they would otherwise be able to do.

It is the purpose of this book to present the results of our research along these lines, and to give an account of the success we achieved in a special "How to Study" course given to college students for the purpose of improving their point of view and their method of work. It aims to describe the factors which contribute most to a student's success in college and in later life, pointing out the kind of remedial instruction that should be given, if we wish to increase their chances for success; also to show what adjustments college students are now making to the factors which really determine one's personal efficiency and success; and lastly, to present some of the results which we obtained by giving certain groups of college students one type of remedial instruction for the purpose of aiding their advancement in learning how to work at their tasks in a more effective way.

The materials presented and the problems discussed in the book will prove of special interest and of practical value to the following groups of persons:

Students enrolled in Orientation or "How to Study" courses designed to teach them how to work in a more effective way. These will find here a description of the elements which determine personal success in study and in other forms of work and many suggestions for improving their methods of work.

Teachers in high schools and colleges interested in supervised study and in Educational personnel will find data and suggestions in the book for placing their work on a more solid psychological and efficiency basis.

Deans and other administrative and personnel officers in high schools and colleges will find data in the book that should enable them (1) to make a wiser selection of the students who are admitted to their institutions; (2) to give those admitted a more efficient and personal type of educational guidance; (3) to adjust the curriculum and work of the institution more helpfully to the individual needs of the students; and lastly (4) to help each student adjust himself better to the traditions and procedure of the institution, and his working load to the factors which condition his personal success both in college and in later life.

The problems treated and the data contained in the book will also be of interest and value to all who desire

to improve their own methods of work because it will help them discover what must be done to learn to work at their tasks in the most effective way.

The author is under special obligation to F. Ridlen Harrell, a Psychology major, whose interest in the problem, enthusiasm and personal work with students and with the mass of data collected during three successive years makes him practically a joint author in the book.

The writer is also under obligation to Prof. H. H. Carter, head of the English Department at Indiana University, and to his corps of instructors in English one whose cooperation and help made it possible to secure much of the data upon which our conclusions are based.

The writer is also obligated to Roy H. Stockrahm who assisted in giving the Reading Tests and in working up the results on this part of our study.

Helpful suggestions were also obtained from Geo. S. Snoddy and E. L. Yeager, colleagues in the department, who read the manuscript and made helpful criticisms. To all of these the author wishes to express his great indebtedness for whatever of merit the book contains.

WILLIAM F. BOOK.

INDIANA UNIVERSITY,
September 1, 1927.

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PART I

FACTORS WHICH CONDITION SUCCESS IN COLLEGE AND IN LATER LIFE

HOW TO SUCCEED IN COLLEGE

CHAPTER I

INTRODUCTION

Much attention has been given of late to the study of individual differences in mental endowment and to the measurement of such differences by means of psychological tests. This represents the greatest single contribution which Psychology has made to educational theory and practice in the past ten years. But what is of even greater importance, perhaps, is the individual's ability to use all his endowments and powers in an effective way when confronted by his tasks.

1. GROWING INTEREST IN PERSONAL EFFICIENCY AND IN EDUCATIONAL PERSONNEL

Special interest has therefore been aroused in the latter problem during the past five years. Following

the personnel and placement work done in the army during the late World War, vocational and educational guidance has had a wide development both within and without the school. In the colleges, special deans of men and women were appointed to look after the problems of individual students and soon began to feel keenly the need of scientific assistance in making their programs more efficient and comprehensive. College and university registrars began to collect personal data to supplement the academic records of students which had been thought sufficient before. Mental testing, because of its practical value in the war, began to be widely resorted to as an aid in selecting suitable applicants for admission. "Freshmen week" which originated at the University of Maine, to introduce freshmen students more successfully into the life, traditions, and work of the college, has been adopted by a large number of institutions. On the instructional side, the sectioning of large classes on the basis of ability has been successfully tried in a number of universities. In other institutions the use of aptitude tests has been employed as an aid in giving individual students more helpful instruction and better educational advice. Orientation and "How to Study" courses for freshmen have opened new avenues of approach to the general problem of giving more personal and practical help to students by way of improving their methods of work and of adapting the

college curriculum more helpfully to their individual needs.

The fundamental aim of all this work has been to offset as far as possible some of the evil effects arising from the increasing enrollments and to improve the students methods of work. To this end the attempt has been made to render a more effective personal service to every student; (1) by attempting to select only the students who can profit by the instruction offered; (2) by giving those who are admitted a more efficient and personal type of vocational and educational guidance; (3) by adjusting the curriculum and work of the institution more specifically to their individual needs; and lastly (4) by helping each student to adjust himself better to his tasks and to the traditions and procedure of the institution by means of instruction given in a special Orientation or "How to Study" course.

Much substantial progress along these lines has already been made. A few textbooks dealing with the problems in this field have already been written.¹ Several national organizations are now chiefly inter-

¹ See especially W. F. Book, "Learning How to Study and Work Effectively," Ginn & Co., Boston, 1926, pp. 475; L. A. Headley, "How to Study in College," Henry Holt & Co., New York, 1926; "The Nature of the World and of Man," by Sixteen Members of the University of Chicago Faculty, Chicago University Press, 1926.

ested in the development of this new type of Educational Personnel. A Department of Personnel Research is devoting all its time to the study of problems of student personnel. Under the auspices of this organization a well attended conference of college and university personnel workers was held at the University of Minnesota last year; this year at West Point and Washington, D. C. The association of deans of men and women students has become greatly interested in the problems in this field and are making important contributions to their solution. The Association of Collegiate Registrars has been studying various aspects of the problem for several years and some valuable reports are found in their proceedings. Special Orientation and "How to Study" courses have been organized in about sixty colleges and universities, and in many of these institutions the course is required of all freshmen. The Mental Hygiene Society, the National Education Association, and the American Psychological Association are all interested in promoting investigations and research in this field.

Too little attention has, however, been given to determining the conditions which now exist among college and university students and to the principles which should direct this work. The workers in the field need to have a more definite idea of the kind of help which college students need to make the right

kind of adjustment, not merely to the college and its work, but to the factors which determine their personal success. We should, therefore, by our research and by our personal work help students make a better mental adjustment not merely to the achievements of the race and the college curriculum as is now attempted in the Orientation courses, but try to improve their points of view and their methods of work.

This may be done (1) by helping each student to get a clearer idea of the factors which really determine his success both in college and in later life; (2) by determining what the situation now is among college students in regard to their methods of work, or the adaptations which they are making to these essential elements in a successful life career; and (3) by helping the students collectively and individually make a more helpful adjustment to the factors which really determine their individual success.

2. PROBLEM TO BE INVESTIGATED AND THEME OF THE BOOK

It is the purpose of this study and book to throw some light on what these essential factors are and on the extent to which college students today are making a successful adjustment to these elements in a successful life.

Some of these factors belong to our native constitution, as every one knows,—such as one's supply of energy and health, his native mental endowment or capacity for learning, and the like. The most important educational problem, however, does not consist in determining more facts about these differences in native endowment or in devising more practical and reliable methods for their measurement, but in finding a way of helping each student learn to make the best possible use of the talents, and the energy, and the time which he possesses. To do this in a successful way he must know what the factors which condition personal efficiency or success in college and in later life really are, and also learn how to make a proper adjustment to these elements in his personal success.

3. ESSENTIAL ELEMENTS IN A SUCCESSFUL COLLEGE AND LIFE CAREER

All would probably agree that the value of a life depends in the first place upon the character of one's ideals or upon his purposes and plans, since these determine not only the course which his activities and energies will take, but serve as a more or less constant incentive for the release of his energy and power. We should, therefore, make a study of the springs of human action and the motives which are dominating the reactions of college students today.

A second factor which helps to determine one's success in college and in later life is the *strength* of his purposes and the constancy with which these objectives can be held in mind. To succeed with his work, a student must earnestly want to succeed and know just what he is trying to do. Most students who fail in their college work, and in later life, do so because their energies are dissipated or applied to too many things. They do not follow their purposes closely enough or constantly enough to execute their plans. Research should, therefore, be directed to the problems in this field, and all the practical work in a special "How to Study" course should be conducted in such a manner as would give students some practical help on each of these points.

A third basic principle which helps to determine a student's success in life and in his college work is the store of energy which he has at his command. Much depends upon the energy and health which he possesses, upon how well he can conserve it, upon how well he has learned to make provision for restoring this energy when exhausted by indulgence in recreation, enjoyment, or actual work. We should, therefore, know what adjustments college students are making to this important group of factors today, and how they may be helped to make a more practical adaptation to these elements in a successful college and life career.

A fourth factor operative in determining personal success is one's ability to save his time. The budgeting of a student's time, the kind and amount of planning which he does, and the adjustments which he is making to this group of factors should be accurately determined since they play such an important role in his present and future success. Lastly, personal success is conditioned by one's past successes or by the habits of thought and work which he has already acquired. Each student's high school record and his previous successes in college should, therefore, be determined and kept track of because they show what he can and will be able to do with his present working load. Much also depends upon the knowledge and skills which a student has already acquired, or upon the power which he has developed to use both his energy and time in an effective way when confronted by his tasks. Specific record blanks, various forms of tests, and new methods of measurement should, therefore, be devised to keep track of this important group of facts.

Making a suitable adaptation to these and other factors which determine individual success in college and in later life constitutes a field of research, and a type of practical service that is of far greater importance to college and high school students than merely trying to adjust them to the mental achievements of the past or to the college curriculum in an Orientation

course. Nothing, in fact, about a student's college work is more important than the development of the most improved methods of work, and acquiring a proper point of view with regard to these and the other factors which condition his personal success.

In our consideration of this problem we shall, therefore, first inquire the extent to which these needed adjustments are being made by college students today, and later point out the extent to which these students may be helped in adapting themselves more successfully to these and the other factors which determine their individual success.

CHAPTER II

METHOD OF INVESTIGATING HOW COLLEGE STUDENTS DO THEIR WORK

As already pointed out the chief aim of our study was to call special attention to the more important factors which condition a student's success in college and in later life, to ascertain what adjustments college students are now making to these elements in a successful life, and lastly to determine the extent to which college students may be assisted in making a more helpful adjustment to all of these factors in a special "How to Study" or Orientation course designed to help them learn how to study and do their other work in a more efficient way.

1. METHOD USED TO INVESTIGATE THE WORKING METHODS OF COLLEGE STUDENTS¹

Our procedure in the investigation of this problem consisted of making a careful study of the methods of work of the freshmen students who entered Indiana

¹ Study made in collaboration with F. Ridlen Harrell, major student in Psychology, Indiana University.

University in the falls of 1924, 1925, and 1926. In each of these years the writer attempted to ascertain how these students spent their total available time; he also tried to learn as much as he could about their habits of life and their methods of work. This was accomplished in the following way. In 1924, three weeks before the end of the first semester, certain information was secured from each student in regard to his methods of work and how he used his total available time. In 1925, three weeks after the opening of the second semester, and this year (1926) six weeks after the beginning of work in the fall, the following data were obtained from all freshmen students who entered the University during the past three years.

During a regular recitation period and on the same day the entire freshmen class was required, under the direction of the writer, to fill out a "weekly schedule blank" specially prepared to show how these students were spending "their total time during a normal week." (See Form 2-A of Personnel Division of Department of Psychology, Indiana University.) Before getting this information from the students, the examiners carefully explained to each class why it was important to determine how university students were using their total available time. All questions raised by the students in filling out the schedule blanks were carefully answered by the examiners and the forms checked, when handed in, to see that all the spaces

on the blank had been properly filled. These "working schedules" therefore showed how each student was spending his 168 hours of available time each week.

In addition to the information contained in these "weekly schedule blanks" certain questions were asked and answered on the front page of the forms to get additional facts about each student's method of work, his present working load, the kind of planning he did, his best hours for work, his capacity for endurance and power to recuperate, his habits of sleeping and eating, the kind of recreation he took, and the things which interfered most with his study and academic success.

All our subjects were also given the Thurstone Intelligence Test, and the ratings made on this test studied in relation to their academic success. In this, we wished to ascertain some of the causes of their success or failure in college, particularly the effect which their ability to economize and use their energy and time had on their academic success.

During the present school year (1926-27) the freshmen class was also given two types of reading tests to ascertain the extent to which they had learned to do this type of student work. This information was desired because a student's ability to read and to make accurate and complete observations of the facts presented in the course of his study has much to do with his success in college and in later life. The same

reading tests were later given to 213 upper classmen divided equally into a training section and a control group.

When the facts revealed by the students' answers to these questions and the data contained in their "Working Schedule," together with the ratings made on the intelligence and reading tests were tabulated and verified, we had information from about 3,000 freshmen students, 319 upper classmen and 177 summer school students, on the following points:¹ (1) How they spent their total available time; (2) the number that regularly attended church and how often they attended each week; (3) how much of their total time was profitably spent and how much was wasted or lost; (4) the amount of time each student spent in study; (5) the time they devoted each day and week to recitations and laboratory work; (6) the number of students who were doing outside work² and the time per week they devoted to it; (7) the time per week

¹ Because of limited space and the great bulk of the data collected, the results for each separate year have not been included in this report. If the figures for 1924 and 1925 had been included they would not materially change the figures given except to make them more bulky and complex.

² The terms "outside work," "working students," and "working group" are used throughout this report in referring to the students who for financial or other reasons are compelled to make a part or all the money required to defray their expenses while attending the University.

spent in planned exercise and play, and the forms of recreation they took; (8) the time devoted each day and week to sleep, and the habits of sleep that were being acquired; (9) the amount of time they devoted to their meals; (10) the extent to which they were compelled to economize on their meals, and whether they made it a practice to rest 15 or 30 minutes after each meal or went directly to their work; (11) the kind of attention they were giving to the selection of their food; (12) each student's working load; (13) their intelligence rating; (14) their academic success; and lastly (15) their ability to read.

2. PROBLEMS ON WHICH DATA WAS SECURED

As may easily be seen, these data throw important light on the problems described somewhat in detail in Section 3 of Chapter I, and which condition a student's success in college and in later life: namely, (1) the ability to conserve one's time, and to use it all in doing the things he is required to do; (2) the attention which these young people give to the restoration of their energy or physical and mental powers; (4) their endurance and power to recover from the effects of fatigue; (5) variations in their mental endowments and the adjustments they are making to these differences in mental strength; (6) their ability to read, or power to note, interpret, retain, and use the facts

to be gotten from books; (7) the character of their ideals and the strength of their motives and desires; (8) their adjustments to the environmental conditions under which college students do their work; (9) their past successes or power to release and control their energy while at work; (10) their present methods of work or ability to use their energy and time in an effective way when confronted by their tasks; (11) their working load and its adjustment not only to their mental ability and physical strength, but to the habit of success already established. The most important facts determined in regard to each of these fundamental problems will therefore be presented in this order in the chapters which follow.

3. GENERAL DESCRIPTION OF THE RESULTS OBTAINED

The data bearing on all these problems were first assembled in the form of a table showing the actual time each student spent per week in study, on outside work, in his recitations or a laboratory, at meals, and the time devoted to exercise and play, to sleep, the total time wasted or lost, the rating which each student made on the intelligence test, the number of hours work carried in college, the number of hours credit made, the credit points earned, his score on two types of reading test, etc. From these data, distribution tables were constructed showing the amount

of time spent by the members of all our groups on each of these major activities, also the record they made on each type of test. Correlation surfaces were then constructed to show the relationship which existed between the various major activities in which these students engaged and between these activities and the different test results.

From our collaboration and study of these data, facts were obtained which bear directly on the fundamental problems enumerated in the preceding section. These facts will first be presented in connection with the problem upon which they throw light, and later discussed in relation to some of the remedial work that has been undertaken in a special "How to Study" course given at Indiana University.

PART II

THE ADJUSTMENTS WHICH COLLEGE
STUDENTS ARE MAKING TO THE
FACTORS WHICH CONDITION THEIR
PERSONAL EFFICIENCY AND SUCCESS

CHAPTER III

THE ABILITY OF COLLEGE STUDENTS TO CONSERVE AND PROFITABLY USE THEIR AVAILABLE TIME

1. HOW FRESHMAN STUDENTS SPEND THEIR TOTAL AVAILABLE TIME

One of our problems was to try to ascertain how college students actually spend their total available time and the extent to which they are able to plan for its effective use.

To this end distribution tables were constructed from the data contained in the weekly schedule forms filled out by the students to show how each student spent his 168 hours of available time in a normal week. These tables showed the amount of time spent on the various major activities in which college students engage. Table I presents the median number of hours which freshmen students spent per week this year in study, in laboratory and class, in sleep, in planned recreation and play, at meals, also the number of hours per week that was wasted or

lost.¹ This table is given because it is typical of the results obtained in the other two years.

TABLE I.—HOW FRESHMEN STUDENTS USE THEIR 168 HOURS OF AVAILABLE TIME EACH WEEK

Median number of hours per week ¹	Median hours spent per week		Cases	
	Boys	Girls	B.	G.
Devoted to study.....	31.66	34.30	528	424
Spent in laboratory and class....	17.81	18.86	528	424
Spent in sleep.....	57.46	57.30	528	426
Devoted to meals.....	12.00	13.00	528	426
Spent in recreation and play....	10.28	4.36	204	77
Total time wasted or lost.....	32.26	31.05	528	424

¹ The items in this table will not total 168 hours because the time spent at church and on outside work by the students who attend church and do outside work is not included.

(1) *Time Devoted to Study.*—As the table shows, the average freshman student at Indiana University spends more than 15 hours per week in laboratory or

¹ The term “wasted time” is used throughout this report to denote the amount of time that, according to the phraseology and opinions of the students, was not spent in a profitable way but was really wasted or lost. It, therefore, represents the amount of time that could have been devoted to useful pursuits if the individual had been truly efficient in this factor of his personal success.

class because all freshmen at Indiana University are required to take a science course during their first year and most of the sciences require extra time for laboratory work. Taking the average enrollment as 15 hours per week and dividing the median number of hours devoted to study each week by the number of hours work taken, we get the average amount of time devoted to the preparation of each lesson, or 2.11 hours per assignment for the boys, and 2.30 hours for the girls.¹

In this connection it is significant to note that the students who are compelled to make their way through college in part or as a whole spend less time, according to their working schedules, in study than do the students not compelled to do any outside work. This fact is clearly shown by the data contained in Table II. But notwithstanding the fact that they spend less time on study and in many cases are compelled to cut down somewhat on their enrollment, the "working students" who remain in school to the end of the semester, if taken as a group, make practically as many credit points during their first semester in college as the "non-working" group who spend more time in study each day and week. These facts are

¹ It would, however, be misleading to draw final conclusions from the central tendency alone for the range in number of hours devoted to each major activity, and the character of the distribution reveal some very significant additional facts.

TABLE II.—MEDIAN NUMBER OF HOURS STUDIED BY THE STUDENTS WHO DO OUTSIDE WORK AND BY THOSE WHO DO NOT

Groups compared	Median hours studied per week		Cases	
	Boys	Girls	B.	G.
Those who worked.....	29.66	33.48	345	209
Those who did not work.....	34.81	35.87	179	212

shown by the data contained in Table III and have important bearings on the methods of work used by these two groups of students. The working boys actually get better results from their study than the

TABLE III.—MEDIAN NUMBER OF CREDIT POINTS MADE BY THE STUDENTS WHO DO OUTSIDE WORK AND BY THOSE WHO DO NOT

Groups compared	Median credit points made		Cases	
	Boys	Girls	B.	G.
Those who worked.....	14.86	18.37	310	208
Those who did not work....	14.70	21.26	176	205

boys who do no outside work, for they make more credit points on fewer hours of study than the boys who do not need to work their way through college.¹

(2) *Time Spent on Other Major Activities.*—The median number of hours devoted to sleep per day is 8.16 hours for the boys and 8.18 hours per day for the girls; but as we shall see later, habits of sleeping among college students are far from the best that could be established. Most students sleep enough; but some sleep more than is healthful or necessary; others do not sleep enough to keep their body in first class condition for work. A few average ten or eleven hours sleep per day. One student carrying 16 hours of college work and working 65 hours per week on outside work got only 5 hours of sleep each day.

The median amount of time spent at a meal is 34 minutes for the boys and 36 minutes for the girls, with no allowance made for rest after the meal. Our schedule blank was arranged in half hour intervals for the meal sections of the day; yet the data show that practically every student takes up his regular work or recreational activities immediately after the meal.

Only 18.16 per cent of the women and 38.63 per cent of the men have planned to take regular exercise to keep their bodies in the most efficient condition for work. Sixty-one per cent of the boys and 82 per cent

¹ For a further discussion of this point see Chapter XI.

of the girls are giving no systematic attention to recreation or play.

2. STUDENTS' ABILITY TO MAKE PROFITABLE USE OF THEIR TOTAL TIME

A careful examination of the schedule forms prepared by our various student groups to show how they spent their total available time each week, revealed the further fact that few college students have learned how to conserve their time or formed the habit of using it all in a profitable way. The schedules of some of the students showed that they wasted as much as 60 hours per week, or twice as much as the average freshman devotes to the preparation of his lessons.

(1) *Time Wasted or Lost*.—Making a study of the distribution table for the group of students who realized that they were wasting considerable time and who so described it in their schedule, we find that the median number of hours marked wasted by this group of boys was 8.72 hours per week, and that the median number of hours wasted per week by this group of girls was 8.70. But if we take all the students whose working schedule was obtained and add the items in their schedules left blank or marked "miscellaneous," "doing nothing," "resting," or labelled "doing nothing in particular," and add the time devoted to aimless or haphazard exercise, the median number of hours

wasted per week mounts to 32.26 for the boys, or an average of 4.61 hours per day, and to 31.05 hours wasted by the girls, or an average of 4.43 hours per day. That is to say, this much time is really lost by the average freshman student so far as doing anything which he considers worth while is concerned.¹

The working students, if taken as a group, waste less time than the non-working group. This fact is brought out by the data contained in Table IV, which shows the median number of hours wasted in a normal week by the students who are compelled to work their way through college and by those who are not. It will also be seen that the students who are compelled to do outside work waste the fewest number of hours per week, showing that the necessity of working has compelled them to save their time. From the data contained in Table V it will be seen that the students who spend the most hours on outside work waste the least amount of time.

These data seem to show that the working students are better motivated than the non-working group or

¹ This statement is based on what the students called time unprofitably spent but is probably a bit too strong since we have evidence that the item "wasted time" included in some cases the time devoted to student activities, such as fraternity and club work. Most students counted these political and social activities as recreational and social. A few put them among the items marked "wasted time."

TABLE IV.—TIME WASTED PER WEEK BY THE STUDENTS WHO WORK AND BY THOSE WHO DO NOT

Groups compared	Median hours wasted per week		Cases	
	Boys	Girls	B.	G.
Working group.....	28.8	25.5	345	212
Non-working group.....	34.6	37.5	178	210

PER CENT OF TOTAL GROUP WASTING OVER 35 HOURS PER WEEK

Groups compared	Per cent wasting over 35 hours per week		Cases	
	Boys	Girls	B.	G.
Working group.....	19	21	345	212
Non-working group.....	51	57	178	210

that they have developed more effective methods of work. It would seem that necessity has forced them to learn to conserve both their energy and their time better than the students who are not compelled to earn their way through college. But as we shall later point out, it is more important for academic

TABLE V.—MEDIAN NUMBER OF HOURS PER WEEK WASTED BY THE STUDENTS WHO DEVOTE THE MOST AND THE FEWEST HOURS TO OUTSIDE WORK

Median hours wasted by:	Median hours worked per week													
	0	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30	31-33	34-44	45-70
Boys.....	35	39	34	34	30	29	27	26	25	24	19	16	18	12
Girls.....	36	32	30	34	25	24	25	28	28	18	22	22	20	6
<i>Total cases</i>														
Boys.....	180	50	66	51	45	21	24	19	14	13	10	7	14	14
Girls.....	208	68	37	17	18	16	12	9	9	7	7	3	9	2

and personal success to improve one's methods of work than to learn how to save one's time. Many students who lose considerable time make more credit points than are made by other students who waste less time.¹ This might be due to superior ability or to the fact that they have developed better methods of work. Our data clearly show that the latter is quite often the case.

(2) *Intelligence Rating of the Students Who Are Wasting the Most and the Least Amount of Time.*—A further study of the problem revealed the important fact that the most intelligent students are wasting as

¹ Compare Chapter XI below, also the data in Tables II and XXVIII.

much or more time as the least intelligent ones.¹ The brightest boys seem to be wasting relatively more time than those ranking at the lower levels on the intelligence test. Of the freshmen boys whose score on the Psychological Test placed them in the highest ten percentile group, 81.8 per cent said they were wasting time, while the weekly schedules of only 78 per cent of those ranking at or below the lowest ten percentile level showed that they were wasting much time. Comparing the middle 50th percentile group of the boys with those who ranked below the 25th percentile level, we get 75.5 per cent for the former and 74.2 per cent for the latter. It would, therefore, seem that the brighter boys are not enough interested in their *college work* to utilize all their time, that they are devoting only so much time to their work as is needed to succeed, and that the more capable they are the less they are inclined to use their total time in ways considered profitable by them. This is probably due to the fact that they do not have to use all their time to succeed with their university work and are not enough interested in their work to use it all in a profitable way.²

¹ This corroborates the results obtained by Mark A. May. See "Predicting Academic Success," *Jr. Ed. Psy.* Vol. 14, pp. 429-44.

² From a personal interview with a number of these boys, it was learned that an additional factor in the situation is the fact that all their work is prescribed. This fact often creates a wrong attitude towards their work.

The case is the same for the girls. The girls who ranked at the higher levels on the Intelligence Test seem to be wasting relatively more time than those ranking at the lower levels. And it holds true for those who work as well as for those who do not need to help make their way through college. This is shown by the data contained in Table VI.

TABLE VI.—MEDIAN NUMBER OF HOURS WASTED PER WEEK BY THE WORKING AND NON-WORKING STUDENTS WHO RANKED AT DIFFERENT LEVELS ON THE INTELLIGENCE TEST

Median hours wasted per week by:	Percentile ranking on intelligence test					Cases
	90-100	70-89	25-69	10-24	0-9	
Working boys.....	32	38	30	27	26	353
Non-working boys.....	32	36	35	30	31	176
Working girls.....	32	28.2	27.5	26.7		211
Non-working girls.....	40	39	35.8	33.5		205

The important thing is, of course, not how much time these students spend on their work but how effectively they can use it while doing their work. But with four and one half hours lost each day for both the boys and the girls or this much time spent each

day in doing things which these students classify as unprofitable, or time wasted, and with the schedules of the brighter students showing that even they are unable to deal successfully with the problem of conserving their time, it would seem necessary to give freshmen students a type of guidance or help which would eliminate as far as possible this great source of waste. They should be shown how to plan their work, and how to budget their time, or be helped to develop habits of work which would enable them to use in a more profitable way their total supply of available time.

It certainly is a significant finding that the amount of time actually wasted by individual students ranges from 1 to 65 hours per week for the boys and from 3 to 72 hours per week for the girls, with a median of 4.61 hours *per day* for the boys and 4.43 hours *per day* for the girls. The significance of this finding is still further increased by the fact that upper classmen have not succeeded in dealing with this problem successfully, since the amount of time that is wasted by them still averages about three and one half hours per day. These facts clearly show that college students stand in need of practical help along this line in order to develop habits of work that will enable them to use all their available time in a profitable way.

3. MOST INTELLIGENT STUDENTS STUDY THE LEAST

Of still more significance, perhaps, is the fact that the brightest students, both among the boys and the girls, are devoting fewer hours per week to study than those ranking at the lower levels on the Psychological Test. In a way, this is what might be expected, for the brightest students do not need to study so much to do their work successfully. Yet it is to be regretted that those who seem to have the best mental endowments should fail to make the most of their ability and be doing only so much work as is required for success in their courses. This is shown by the data contained in Table VII, which gives the median num-

TABLE VII.—MEDIAN HOURS PER WEEK DEVOTED TO STUDY
BY STUDENTS RANKING AT VARIOUS LEVELS ON THE
INTELLIGENCE TEST

Hours studied per week by students ranking:	Hours per week devoted to study		Cases	
	Boys	Girls	B.	G.
1. In highest 10 percentile group.	30.25	30.31	46	35
2. In highest 25 percentile group.	31.20	31.75	123	115
3. In middle 50 percentile group.	32.68	34.80	283	238
4. In lowest 25 percentile group.	34.40	34.04	21	73
5. In lowest 10 percentile group.	35.00	35.50	43	26

ber of hours per week devoted to study by the students who ranked at various levels on the Intelligence Tests. As the table shows, those ranking at the highest levels on the Psychological Test, if taken as a group, study the least; those whose test scores place them at the lower levels of the distribution studied the most hours per week. There are, to be sure, some important individual variations from this central tendency in each direction, but space prevents us from including all these facts. It should be remembered, that there are just as many students who are worse than there are students who are better than this general level of the group taken as a whole.

4. EFFECT OF OUTSIDE WORK ON THE HOURS DEVOTED TO STUDY

Another outstanding fact in our results is the large number of boys and girls who work their way through college, either entirely or in part. Our data showed that 65.9 per cent of the freshmen boys this year do outside work, while only 50.4 per cent of the girls do some outside work to help make their way through college. Fifty-seven per cent of these working boys spent more than 10 hours per week on outside work, while only 37 per cent of the girls spent this much time on outside work. The time actually spent on outside work ranged from 1 to 65 hours per week for the boys, and from 1 to 54 hours per week for the girls.

A study of the distribution tables showing the amount of time devoted to study by the students who had to make a part or all of their way through college by doing outside work and for those who did not, revealed the fact that the students who do outside work study fewer hours per week than those who do not. Moreover, those who spend the most hours on outside work do the least studying. This is shown by the data given in Table VIII.

TABLE VIII.—MEDIAN NUMBER OF HOURS PER WEEK DEVOTED TO STUDY BY THE STUDENTS WHO DO OUTSIDE WORK AND BY THOSE WHO DO NOT

Groups compared	Median number of hours devoted to study per week		Cases	
	Boys	Girls	B.	G.
1. All freshmen students.....	31.8	34.5	527	424
2. Students not working.....	33.96	35.52	228	277
3. Students working from 10 to 20 hours per week.....	30.00	32.8	295	146
4. Students working over 30 hours per week.....	26.30	30.00	50	23

This result might at first be thought to be due to the fact that those who are compelled to do outside

work are not enrolled in as many hours of college work as the non-working group. But the enrollment in academic courses is practically the same for the two groups as will be shown later,¹ and the working groups make practically the same number of credit hours and credit points as the non-working group,—almost but not quite, as the data in Tables IX, X and XI will show.

TABLE IX.—MEDIAN NUMBER OF CREDITS MADE BY STUDENTS WHO WORK AND BY THOSE WHO DO NOT

Groups compared	Median hours of credit made first semester of 1926-27				
	Not working	Working 1-9 hrs.	Working 10-30 hrs.	Working 31-70 hrs.	Cases
Boys.....	15.24	15.00	14.47	13.5	523
Girls.....	15.67	15.24	15.71	13.0	422

The girls do more studying and make more credits and credit points than the boys. This is true for both the group who do outside work and for the group who do not. The original data sheets also revealed some very significant facts about individual students on this and other problems. For example, one boy who studied only six hours per week worked 51 hours

¹ See Chapter VII, Section 5 (1) of this report.

TABLE X.—MEDIAN NUMBER OF CREDIT POINTS MADE BY STUDENTS DEVOTING DIFFERENT AMOUNTS OF TIME TO OUTSIDE WORK

Groups compared	Hours devoted to outside work					Cases
	0	1-3	4-10	11-30	31-70	
Boys.....	15.90	15.50	15.31	14.27	14.75	482
Girls.....	21.37	17.00	18.50	17.70	18.25	412
<i>Cases</i>						
Boys.....	171	45	107	126	33	482
<i>Cases</i>						
Girls.....	206	64	54	75	13	413

TABLE XI.—PER CENT OF WORKING AND NON-WORKING STUDENTS WHO ATTAIN VARIOUS DEGREES OF ACADEMIC SUCCESS

Groups compared	Per cent making credit points			Cases
	Over 37	Over 20	Less than 8	
Working boys.....	5	30	29	311
Non-working boys.....	7	33	32	171
Working girls.....	10	43	27	207
Non-working girls.....	8	55	17	206

each week on outside work, was enrolled in 16 hours of academic work, spent only 10 hours per week at

meals, and ranked at the 12th percentile level on the Psychological Test.

5. EFFECT OF OUTSIDE WORK ON ACADEMIC SUCCESS

Comparing the academic success of the working and non-working students more closely we find that, if taken as a group, the working students succeed better with their college work than do the students who are not compelled to make their own way through college. This fact is shown by the data contained in Table XII, which shows that regardless of the number of hours in which these freshmen students were enrolled, a larger

TABLE XII.—PER CENT OF WORKING AND NON-WORKING STUDENTS WHO COMPLETED THEIR TOTAL ENROLLMENT SATISFACTORILY IN THEIR FIRST SEMESTER

Groups compared	Hours enrolled								Total cases
	21	19	18	17	16	15	Average	14 or less	
<i>Boys</i>									
Not working.....	0	...	50	53	56	50	52	..	179
Working under 10 hrs.....	...	...	0	60	44	62	54	42	184
Working over 10 hrs.....	...	...	...	61	40	67	56	..	160
Total cases.....	1	...	4	125	309	31	..	53	523
<i>Girls</i>									
Not working.....	...	100	25	62	73	57	63	..	210
Working under 10 hrs.....	100	...	100	40	51	67	72	41	127
Working over 10 hrs.....	...	...	50	81	61	100	64	..	85
Total cases.....	1	1	7	58	307	20	..	28	422

percentage of the working boys and girls completed their total enrollment satisfactorily than was the case for the group that did not have to do any outside work. It further appears from the data in this table that only about half the freshmen students for the first semester of the present year (1926-27) completed *all* their courses in a manner that was satisfactory to their instructors. That is to say, only about half the freshmen class got credit in their first semester for all the work in which they were enrolled.

The distribution tables from which these data were taken showed that a total of 41 boys and 10 freshmen girls dropped out of school before completing their first semester's work. Thirty-four of these boys were working their way through college. Fifteen of these 34 were working more than 10 hours per week and were each enrolled in 9 or 10 hours of academic work. Seven of the 41 boys were not working and were each enrolled in only 8 hours of academic work. Eight of the 10 girls who dropped out of college before the end of their first semester were working and were enrolled in 10 or 12 hours of academic work. Two of the 10 girls who withdrew were not working and were enrolled in only 8 hours of academic work. The suggestion from this data is that the working boys and girls, who comprised the bulk of the group, dropped out for financial reasons rather than because they were unable to do their academic work.

6. CAUSE OF THE SUPERIOR SUCCESS OF THE WORKING STUDENTS

That the working students, if taken as a group, succeed better with their academic work than the students who are not compelled to make their way through college is proof of the fact that they have developed more effective methods of work or that they have a stronger motive or determination to succeed with their college work or that they excel in both these respects. This is suggested not only by the fact that they succeed better with their work in spite of the extra load put upon them by their outside duties but by the further fact that, taken as a group, they rate somewhat lower on the Intelligence Test than the students who are not compelled to work their way through college.¹ Here as elsewhere in life, necessity seems to be the mother of invention, making these working students improve their methods of work, and learn to economize their energy and time. This enabled them to do better work in less time with a slightly inferior mental equipment than was possessed by their seemingly more fortunate classmates who did not have to devote any of their time or energy to outside work.

¹ Compare Table XVI, page 79.

CHAPTER IV

ATTENTION GIVEN BY COLLEGE STUDENTS TO THE CONSERVATION OF THEIR ENERGY AND HEALTH

. A student may conserve his energy (1) by taking short periods for relaxation during long stretches of continuous work on a difficult problem; (2) by taking the right kind and amount of exercise, or giving due attention to recreation and play; (3) by improving his methods of work; (4) by caring for his health; and (5) by adjusting his working load to his mental ability, past successes, and physical strength. Facts pertaining to the first four of these factors are presented in this section. Data on the fifth problem will be presented in Chapter XII of this report.

1. USE MADE OF THE PRINCIPLE OF RELAXATION

When asked how long they could continue work on a difficult task before becoming too tired to do effective work, most students said they could work only about two hours. The median for all the girls

was 1 hour and 45 minutes; for the boys the median was 2 hours and 25 minutes. Some students stated, however, that by taking five or six minutes of rest after each 25 or 30 minute period of strenuous work, they could continue to work on a difficult task for from 6 to 8 hours before becoming too tired to do effective work.

Experiments with many types of work have proven that this estimate is about correct. Taylor obtained an increase of 400 per cent in output of work in his experiments on loading pig iron merely by determining by careful experimentation how often such periods of rest should be introduced and how long they should be continued to obtain the best results. Other experiments have shown the same thing; yet college students do not make any effective use of the principle of relaxation to keep their fatigue down to a minimum, or to increase their ability to work.

Less than one per cent of the freshmen students in the University in 1926-27 made any systematic use of the principle of relaxation to conserve their energy or to increase the efficiency of their methods of work. It may be urged that college students do not work hard or long enough to need to relax, but on certain occasions they work all night and do not even make use of this principle when they prepare for their final examinations.

2. ATTENTION GIVEN TO RECREATION AND PLAY

Human energy is also conserved by developing habits of taking systematic recreation or by engaging in the right kind of sports and games. This is absolutely needed to maintain one's working efficiency and to conserve his energy and health. Yet the fact is that only 18.16 per cent of the girls and 38.63 per cent of the boys showed by their weekly schedule that they were taking regular exercise, or that they had planned any form of recreation for the week. Moreover, the amount of time devoted to such activity by those who give some attention to this point was less than is needed to keep their organism in the best condition for mental work. Our results clearly showed that every student needs much definite and practical help to make a proper adjustment here.

The median number of hours devoted to recreation by the few students who were caring for this point was 4.36 hours per week for the girls, and 10.28 hours per week for the boys. Moreover, the exercise taken was more or less spasmodic and not of the proper sort. Most students take some haphazard exercise during the week, but from the kind taken and from the way it is taken, we must conclude that its chief value for the student is largely if not entirely lost, even though there was spent in this aimless way an average of 16.2 hours per week by 83.36 per cent of the boys and 15.85

hours per week by 87.27 per cent of the freshmen girls.

3. FORMS OF RECREATION TAKEN BY INDIANA FRESHMEN

It is important to point out the forms of recreation which these freshmen students say they take. The forms most often mentioned by the small group who plan for regular exercise and by those who take some time out for irregular recreation are the following: walking, mentioned by 55.8 per cent of the girls; going to movies by 38.2 per cent; dancing by 32 per cent; reading by 25.6 per cent; Gym by 24.5 per cent; swimming by 16.5 per cent; volley ball by 12 per cent; visiting by 9.7 per cent; music by 8.1 per cent; with the following receiving a lesser number of votes: parties 3.5 per cent, riding 4.5 per cent, resting 4.5 per cent, cards 4.6 per cent, and hockey 6 per cent. Basket ball, Sunday School, social hour, letter writing, sewing, lectures, church work, etc. were all mentioned by one or more students as a form of recreation indulged in by them.

For the boys the forms of exercise most often mentioned are in order of importance: swimming 43 per cent; movies and theater 33.6 per cent; walking 31.6 per cent; dancing 16.5 per cent; football 16 per cent; reading 12.2 per cent; tennis 12 per cent; and track 10.5 per cent. Such athletic contests as basket ball,

speed ball, baseball and military training were each mentioned by about 7 per cent of the students taking part in this experiment. The following forms of recreation were mentioned by still fewer individuals: cards, talking, dates, music, pool, attending social gatherings, bank work, hand ball, riding, working, billiards, radio, loafing, wrestling, boxing, waiting table, checkers, letter writing, work on farm, and pitching horse shoes.

The question naturally arises whether these forms of exercise are sufficient to restore a proper balance to the mental and physical powers of these students and whether the recreation is taken in a way which will keep their physical and mental powers up to their maximum efficiency for enjoyment and work. Our data clearly indicate that habits which would insure the taking of the proper kind and amount of recreation have not been established by the various student groups who took part in our experiments.

4. ATTENTION GIVEN TO IMPROVING THEIR METHODS OF WORK

One of the best ways to conserve human energy and time is to improve one's methods of work, by making a systematic study of his tasks to find new and better ways of doing each thing that one is called upon to do. By making a scientific analysis of his tasks and by

being constantly on the watch for things that will improve his methods of work in everything he does, a student may conserve much energy and time. But conferences held with large numbers of students and a careful study of their schedule forms showed that only a few college students have learned to pay any attention to this source of their personal efficiency, and that those who have learned to give some attention to this problem do not know how to make a scientific analysis of their tasks for the purpose of improving their methods of work. Much concrete and practical help could therefore be given to college students along this line.¹

5. AMOUNT OF EFFECTIVE PLANNING DONE

The most important single factor, however, in conserving a student's energy and time is that of planning his work and learning how to plan for the most effective use of his time. Yet our data showed that only 22 per cent of the boys and 30 per cent of the girls make any systematic attempt to plan their work or to plan for the use of the time not spent in the classroom or laboratory. Our data further showed that those who are attempting to plan their work have really not learned how to do it effectively. Many of the small

¹ Compare W. F. Book "Learning How to Study and Work Effectively" Chapters IX to XVI. Ginn and Company, Pub., 1926.

group of students who stated that they were trying to plan their work, said they could not execute the plans they had made. In fact, our data showed conclusively that even the students who try to plan are very deficient in the planning they do, while the case of the 78 per cent who do not even attempt to plan their work is of course very much worse.

The highest type of success requires a careful planning of one's procedure in advance. This includes (1) a listing of the things to be done in the exact order in which they are to be performed; (2) making some study of these tasks to determine the time that will be required for their performance and the best way to do each thing to be done; (3) the making of a working schedule showing just what is to be done and when it is to be begun and finished; (4) making proper arrangements for carrying out this plan, including the making of all conditions favorable for doing the work; (5) preparing a definite set of instructions for carrying out one's plan when finally made; (6) seeing that the plan as made is promptly carried out. Before this can be done in a successful way, much practical help must be given to every individual to establish a set of habits that will enable him to work in this efficient way. Much remedial work must therefore be done with college students because their previous work in school and in life has not been supervised in a way that will enable them to work in this effective way.

6. CONSIDERATION GIVEN TO THE CONSERVATION OF THEIR HEALTH

The most serious drain made upon the vital energies of students is caused by disease and by violations of the laws of health. Indiana University takes special pains to care for the health of its students. A free medical examination is given each student when he enters the University. Special follow-up work is done on those who show any serious deficiencies or handicaps of health. Free medical service is provided by the office of the University physician for both the men and the women who become ill, and in case of need each student is referred to a competent physician in the city. Vaccines and special X-ray treatments are provided for those who need such service, and special care is exercised to prevent the spread of all contagious diseases. A special examination is also given those who have serious disorders of the tonsils or kidneys, and a special nurse is provided for the dormitories. Medical advice is also given to the department of physical education for corrective gymnastics for those who need it, and all students above freshman standing who apply for extra work must have a certificate from the University physician stating that they are physically able to do the extra work. In a special Hygiene course, which all freshmen students are required to take, they are given

much practical information in regard to caring for their health.

But notwithstanding all these precautions and helps on the part of the University, our results clearly show that habits of healthful living have not and are not being established, and that some of the most basic laws for the conservation of human energy and health are being violated by the majority of the students who took part in our experiment. Merely lecturing to these students about Hygiene and the laws of health, or even pointing out the evil effects of the neglect of these laws has little effect. College students must be shown how to plan their time and their work. They must be helped to establish proper habits of work and living, habits of taking the proper kind and amount of exercise and sleep, proper habits of eating, and the like. A more healthful attitude must be developed towards their work, and above all, every college student should be helped to adjust his working load to his mental ability and physical strength as we shall later point out.

CHAPTER V

ATTENTION WHICH FRESHMEN STUDENTS GIVE TO THE RESTORATION OF THE ENERGY CONSUMED BY THEIR DAILY ACTIVITIES AND WORK

What is of even greater importance than learning to conserve the energy we possess is making proper provisions for its restoration through the means which nature has provided to keep the human organism in first class working condition and repair. Human energy is restored by the kind and amount of sleep which one takes, by the kind of food he eats, by his ability to digest the food consumed, and by the attention which is given to breathing and the other means for restoring the energy consumed by enjoyment and work. How do freshmen students at Indiana University take care of this fundamental problem in their lives?

1. TOTAL TIME DEVOTED TO SLEEP

The median number of hours that were devoted to sleep each week by our total group of freshmen boys

was 57.46, or an average of 8.2 hours per day. The median number of hours that were devoted to sleep each week by the girls was 57.30, or an average of 8.18 hours per day. It would, therefore, seem that enough time is devoted to sleep by the average college student to keep his mental and physical condition up to the maximum efficiency each day. But if we examine the working schedules of these students to ascertain how this sleep was actually taken and note the individual differences which exist in regard to this element in personal success, the case is not so hopeful. The range in hours devoted to sleep per week extended from 37 to 76 for the girls, and from 35 to 74 for the boys. Nine boys and 8 girls belonging to the freshmen class this year showed by their weekly schedule blanks that they slept more than 10 hours per day and so doubtless got more sleep than they need, or that they had formed the habit of not sleeping restfully while they sleep. The working schedules of the students further showed that no regular habit of taking rest had been established by many of the students. That is to say, they would on certain nights study very late and make up for the loss of sleep for that night on the following day. Some slept half the day on Sunday to make up for the loss of sleep on Saturday and Friday nights. Our distribution tables and individual data sheets further showed that many students with a heavy academic and working

schedule are getting too little sleep. One student enrolled in 16 hours of academic work and who worked 65 hours per week on the side slept only 5 hours per day while those who sleep over 9 or 10 hours per day generally study less and waste more time than those who devote only 7 or 8 hours per day to sleep. On the whole, there was no positive correlation between the amount of time devoted to study and to sleep.

2. OTHER FACTS ABOUT THE HABITS OF SLEEP THAT ARE BEING ESTABLISHED BY COLLEGE STUDENTS

One of the outstanding facts shown by the various correlation surfaces worked out to study the relationship which exists between the various factors and

TABLE XIII.—MEDIAN NUMBER OF HOURS OF TIME SPENT IN STUDY BY STUDENTS DEVOTING THE MOST AND THE LEAST TIME TO SLEEP

Groups compared	Median hours per week devoted to study		Cases	
	Boys	Girls	B.	G.
Those sleeping from 65 to 76 hours per week.....	29.50	30.75	55	47
Those sleeping 56 hours per week.....	31.71	34.82	67	57
Those sleeping from 35 to 50 hours per week.....	35.75	37.50	47	16

traits studied in the present experiment is the fact that the students who sleep the most study the least. This was true for both the boys and the girls and is shown by the data given in Table XIII.

It is also significant to point out that the students who sleep the most, spend, according to their working schedule, the *least* amount of time on outside work. This is true for both the boys and the girls, and is shown by the facts set forth in Table XIV.

TABLE XIV.—MEDIAN NUMBER OF HOURS SPENT ON OUTSIDE EMPLOYMENT BY THE STUDENTS WHO SLEEP THE MOST AND THE LEAST NUMBER OF HOURS PER WEEK

Groups compared	Median number of hrs. spent per week, on outside employment		Cases	
	Boys	Girls	B.	G.
Those sleeping from 65 to 76 hours per week.....	10.79	10.50	25	13
Those sleeping from 51 to 64 hours per week.....	11.03	12.70	224	116
Those sleeping 56 hours per week.....	11.25	13.30	47	22
Those sleeping from 35 to 50 hours per week.....	13.34	13.75	30	15

This fact is shown in still another way by the median number of hours per day devoted to sleep by

those spending some time on outside employment. This data is given in Table XV and shows that the students who spend the most time in doing outside work sleep the least. This fact has special significance for the personal hygiene and future success of these students.

TABLE XV.—MEDIAN NUMBER OF HOURS SLEEP TAKEN PER DAY BY THE STUDENTS WHO SPEND VARYING AMOUNTS OF TIME ON OUTSIDE WORK

Groups compared	Median number of hrs. spent in sleep each day		Cases	
	Boys	Girls	B.	G.
Those working from 40 to 70 hours per week.....	7.21	7.64	23	9
Those working from 20 to 25 hours per week.....	8.00	8.20	91	48
Those working from 10 to 19 hours per week.....	8.13	8.36	196	87

These facts clearly show that the most helpful habits of restoring human energy by means of sleep have not been established by the college students whose methods of work were studied in this experiment. Our results clearly show that college students need to be helped to determine for themselves how much sleep

they need to keep their bodies and minds at the highest state of efficiency; that they should be made to realize the need for taking such care of their living machines; and that they should be shown how they must proceed to establish a set of habits that will keep their bodies and minds at the highest state of efficiency. This can not be done unless suitable provisions are made for the restoration of the energy normally consumed by their daily activities and work.

3. TIME AND ATTENTION GIVEN TO EATING

Too little attention is also given by college students to the question of eating and to making conditions favorable for the digestion of their food. The median number of hours devoted to meals each week was 12 for the boys, and 13 for the girls, or an average of 1 hour and 42 minutes per day for the boys, and 1 hour and 52 minutes per day for the girls. This is 34 minutes a meal for the boys and 36 minutes a meal for the girls. But this does not tell the whole story. The range in the number of hours devoted to eating each week varied from 0 to 23 for the boys and from 1 to 26 hours for the girls. Ten working boys made no allowance on their weekly schedule for meals. That is to say, no time was taken off for meals. The schedules of 18 other boys and 12 girls showed that they devoted

less than one hour per day to the eating of their meals.¹

What is still more serious for future efficiency and health is the fact that so little attention is given to the matter of making conditions favorable for the digestion of the food that is consumed, and in the case of those eating at cafeterias and restaurants, to the selection of their foods. Only 19 per cent of the girls and 45 per cent of the boys taking part in our experiments had arranged to take a little time off after each meal to give their digestive organs a chance to handle their food properly. Eighty-two per cent of the girls and 55 per cent of the boys paid no attention whatever to this point though a special space was left on the weekly schedule blank for recording this fact. Twenty-one per cent of the boys and 9 per cent of the girls stated in answer to the question, "Do you find it necessary to economize on your meals for financial reasons," that they were compelled to economize on their meals or board to remain in college. Eight per cent of the boys and 5 per cent of the girls stated in answer to the question that they took only one meal per day.

¹ One freshman boy was found who was working 68 hours per week. He took no regular time out for his meals. He drank a bottle of milk in the morning and ate a sandwich while studying his lessons in the cloak room at the University Library where he spent about 70 hours per week checking student wraps.

These and other facts show that proper provisions are not being made by college students for the restoration of their energy through eating and the digestion of their food. And when we reflect that it is the digestive system that wears out first, causing us to grow old and die, and that digestion will not go on normally if psychological and physiological conditions are not made favorable, the importance of such facts as those enumerated above, becomes all the more significant for the present and future happiness and success of these student groups.

4. TIME DEVOTED TO RELAXATION AND REST

As previously stated, very little attention is given by college students to relaxation. But about an hour per day was spent, by 69 per cent of the boys and 62 per cent of the girls, in resting. Some students spend as much as 5 or 6 hours per day just resting or doing nothing. The median number of hours devoted each week to rest was 7.34 for the boys, and 6.5 for the girls. If the remaining time of these students were spent in work and in wholesome exercise, this much time for rest would be profitably spent, because it would be an aid for restoring the energy balance in the body. But a careful study of the schedules of this group of students showed very clearly that there was only in the case of a few individuals a proper alter-

nation between their periods of work and rest, such as should be the case if the conditions were made favorable for the greatest personal efficiency and health. In other words, right habits in regard to this element in our problem are not being established by the students who took part in the experiment; and much remedial instruction along this line must be given before right habits in this direction can be established.

5. ATTENTION GIVEN TO CORRECT BREATHING

According to the working schedules made out by our total group of students and their account of the conditions under which they work, no attention whatever was given by these college students to the problem of getting pure air into their working quarters. The matter is pretty well regulated for their sleeping quarters by the house rules of the various organizations and dormitories on the campus, but in the case of students rooming in private homes where such matters must be looked after by themselves, there is every reason to believe that the question is solved in the same way that it is taken care of in their working quarters where no provisions are made for efficient breathing, for providing the best working conditions, or for making the physiological and psychological conditions most favorable for health and effective work. Much practical help in this direction is therefore needed by college students.

CHAPTER VI

VARIATIONS AMONG COLLEGE STUDENTS IN ENDURANCE AND IN POWER TO RECOVER FROM THE EFFECTS OF FATIGUE

An individual's capacity for endurance not only determines his resistance to disease and death, but conditions his rate of learning and his ability to succeed with his work. How much vitality do you possess? How much stimulation can you stand when confronted by some instance of learning or a difficult task? How much resistance do you have when attacked by disease? How many hardships and disappointments can you endure when encountering difficulties in your work? How long can you continue to work at a difficult task before you get too tired to do effective work? Individuals differ widely in all these respects; also in their power to recover from the effects of continued stimulation or work.

1. VARIATIONS IN ABILITY TO RECOVER FROM THE EFFECTS OF FATIGUE

Our results throw light on only two of these questions. In the first place, our data clearly show that

some students need a great deal more sleep than others, either because they fatigue more easily and rapidly or because they are slow to recuperate, or because they have not formed the habit of getting proper rest while they sleep. These three factors in varying degrees may account for the fact that some students regularly take and apparently require more than twice as much sleep as others. No correlation was, therefore, found between the amount of sleep taken and the amount of work attempted or done. In fact, those who sleep the least seem to do the most work. Whether this work is done on borrowed energy or whether the persons who sleep the fewest number of hours per day have more vitality and so can do effective work on fewer hours of sleep, it is impossible to say from the data at hand. Either condition would account for the facts. But that there is a marked difference among college students in regard to their power to resist fatigue and in their ability to recover from the normal effects of their work is certain, a fact that should be taken into account in planning one's life and work, and in deciding upon one's working load.

2. VARIATIONS IN ENDURANCE

A second bit of evidence pertains to the variations in endurance that were found among college students, our data on this point consists of their answers to the question: "How long can you continue to work on a

difficult problem before you get too tired to do efficient work?" The answers to this question ranged from the 24 boys and 3 girls who stated that they had never reached such a stage or that they could continue until the task was completed, to the answer given by 14 boys and 5 girls who said that they could work in this manner less than an hour before they got too tired to do effective work. Seven per cent of the boys and six per cent of the girls stated that they could continue such work only one hour. Twenty-two per cent of the boys (22.3) and 14 per cent of the girls (14.4) said they could continue such work for three hours before becoming too fatigued to do a standard grade of work. Several students claimed they could continue five or six hours before becoming too tired to do first class work. The median time for all the boys was 2 hours and 25 minutes, and 1 hour and 45 minutes for the girls.

This latter fact taken together with the fact that the range for the boys started higher and ended higher than it did for the girls shows that boys seem to have more endurance than the girls.

3. NEED FOR A NEW TYPE OF PSYCHOLOGICAL MEASUREMENT

The great importance for future health and success, of this factor of endurance, and the marked variations which exist among college students in regard to their

power to recover from the normal effects of work, points to the need for a definite and accurate determination by every student of his endowments in this regard, especially his limitations along these lines. The writer believes that the time will speedily come when suitable adjustments will be made, by both the instructor and learner, to the student's endurance and capacity to recover from the normal effects of his work. When the need for this adjustment is keenly enough felt, some one will discover a practical and reliable way of measuring the trait. It is to be regretted that so little attention is now given to the matter of adjusting a student's working load to his mental ability and physical strength, and that students are given no help at all for making a right adjustment to this important factor in human life and work.

One practical outcome of such studies as the one here reported should be to discover a way of giving young people more definite help along this line. If this were done, fewer college students would need to take a course in a hospital to get the fundamentals of an education after they have graduated from a college or university sometimes with a *Phi Beta Kappa* Key or a *Cum Lauda* degree.

CHAPTER VII

VARIATIONS AMONG COLLEGE STUDENTS IN MENTAL EQUIPMENT AND STRENGTH

As is now generally known, there are marked and important differences among college students in their capacity to learn, in their ability to retain what has been learned, in their fundamental sensory and motor equipment, in the type of attention and will which they possess, in the habits of success which they have already established, and in their ability to use the knowledge and experiences they have acquired when confronted by a new problem or difficulty. In these and in many other ways college students differ tremendously, as may be determined by giving them standardized psychological and performance tests. It is also generally conceded that these differences in mental constitution should not be diminished or obliterated by our educational work even if this could be successfully done. It is rather believed that these differences should be fostered, accurately determined, and proper adjustments made in all our educational work to such differences as actually exist.

1. DIFFERENCES IN MENTAL ABILITY FOUND AMONG COLLEGE STUDENTS

The results obtained by giving three thousand college freshmen a standard intelligence test, revealed the usual range of difference in the mental abilities of these students that have always been found where psychological tests have been given. These data also reveal other important facts about these differences, such as the marked difference in range between the ablest and the least capable members of this freshman group and the number of persons within the total group who ranked at the various mental levels revealed by the test results.

Using as our norm and basis for comparison the ratings made on the test we used, by 6500 freshmen students from 35 colleges located in all parts of the country, and transforming the scores made by these students and by our first freshmen group into one hundred percentile levels, we get the distribution of ability for the 3476 college students we tested.

In each of the freshmen groups there were a few students who ranked, on the test, at the 99th or 100th percentile level. In this year's class, for example, there were eleven students who ranked at this highest level on the intelligence test, 5 boys and 6 girls. Relatively more individuals ranked at or above the 90th percentile level, and about an equal

number of our total group ranked at or below the 10th percentile level. Most of our freshmen ranked in between these extremes.

2. RATINGS MADE ON THE INTELLIGENCE TEST BY THE WORKING AND NON-WORKING STUDENTS

It is a matter of considerable importance, perhaps, that a larger percentage of the students required to make their own way through college, as a whole or in part, ranked lower on the psychological test than was the case for the group of freshmen who were not compelled for financial or other reasons to do some outside work. As the data in Table XVI shows, the central tendency for the ratings made on the mental test is somewhat higher for the non-working students than it is for the working group.

TABLE XVI.—MEDIAN PERCENTILE RATING OF THE STUDENTS WHO WORK AND THOSE WHO DO NOT

Group	Time spent on outside work per week				Median percentile rating for the entire working group
	Those not working	Working 1-9 hrs.	Working 10-21 hrs.	Working 22-60 hrs.	
Boys	55.25	48.00	55.60	47.00	51.50
Girls	55.00	48.50	49.00	55.00	49.25
<i>Total cases</i>					
Boys	178	167	112	66	523
Girls	210	120	55	37	422

This is true for both the boys and the girls and suggests that the parents of the students who are compelled to make their own way through college by doing outside work are probably less able to provide sufficient means for the education of their children than the parents of the non-working group. The former seem to be mentally unable to compete with the parents of the brighter students belonging to the non-working group.

But there are some notable exceptions to this rule. Some of the brightest students who come to the University are among the working group. For example in this year's freshmen class four out of the five boys who ranked at the 99th percentile level on the psychological test were working from 20 to 69 hours per week to remain in school. One had to drop out before the end of the semester. Two out of the six brightest girls in this year's freshmen class were obliged to work to remain in college and 16 out of the 35 girls who rated above the 90th percentile on these tests or 46 per cent, belong to the working group. In the case of the boys the fact that the brightest students in the University are doing some outside work to help make their way through college is still more marked. Thirty-three of the 47 freshmen boys who this year rated above the 90th percentile level on the psychological test, or 70 per cent, had to do some outside work to remain in college.

Four of these boys were working more than 22 hours per week and one rating at the 99th percentile level had to drop out before the end of his first semester because he could not find enough work to do to make his way, and was not helped before he got away.

It is also true that a larger percentage of the working students rank at the lower levels on the psychological test. These and other important facts are shown by the data given in Table XVII, which shows the per cent of all the working and non-working students in this year's freshmen class (1926-27) who ranked at the various percentile levels on the psychological test. As will be seen from an inspection of these data, a larger percentage of the working boys ranked at the highest levels on the Intelligence Test. A much larger percentage of the working boys and girls also ranked at the lowest levels on this test, while more of the non-working group ranked near or immediately above the 50th percentile level. This gives the non-working group the marked advantage shown by the central tendency revealed by the data contained in Table XVI.

It is clear from this and other data obtained that some of the brightest students coming to Indiana University are not receiving the encouragement and help that should be given them by their parents, and perhaps by University officials. Some of these brightest students may be compelled to make their own way

TABLE XVII.—PER CENT OF WORKING AND NON-WORKING STUDENTS WHO RANKED AT VARIOUS PERCENTILE LEVELS ON THE INTELLIGENCE TEST

Groups compared	Percentile levels					Cases
	91-100	70-90	25-69	13-24	0-12	
Working boys	9.0	22.4	44.5	16.1	8.5	353
Non-working boys.....	8.5	19.3	52.2	13.6	6.2	173
Working Girls.....	7.6	21.8	51.2	10.9	8.6	211
Non-working girls.....	10.0	20.5	55.2	10.0	4.3	205

because their parents have refused to help them when they were able to do so as was the case with one bright student whom the writer came to know very well.

3. IMPORTANCE OF THESE DIFFERENCES IN MENTAL ENDOWMENT

The fact that some students possess the mental capacities measured by this test in greater amounts than others, as the ratings made on the test so clearly show, is an important factor in determining their success in college and in after life. According to the results of Mays it is the greatest single factor in determining academic success.¹ It is clear that when it comes to such problems as those involved in learning

¹ See Mark A. Mays. *Predicting Academic Success. Jr. Ed. Psy.*, Vol. 14, pp. 429-440.

how to do one's work in a more successful way and learning to deal more successfully with new problems, the students ranking at the higher levels on the test would, of course, have a decided advantage. But other endowments not measured by this test also have an important bearing on what a student will be able to do, and so on the success which he is likely to achieve in college and in later life. Among these are his determination or type of will, his endurance, the character of his ideals or his life purposes and plans. But no quantitative data on the individual variations with regard to this group of endowments were obtained because no reliable methods for their measurement have as yet been devised.

But the results obtained from the ratings made on the intelligence test, if taken in connection with other data which we secured, throw important light on why so many pupils are failing in their work. They also help us to understand why some of these students have not developed more effective methods of work, why they ignore some of the most important problems in life, and why they so often fail to attend to the most important things connected with their work.

4. INTELLIGENCE RATING AND ACADEMIC SUCCESS

That the possession of the mental abilities measured by the Intelligence Test given to our freshmen groups has much to do with the success that a student will

achieve in his college work is shown by the data contained in Tables XVIII and XIX. Table XVIII shows the median number of credit points¹ made by

TABLE XVIII.—MEDIAN NUMBER OF CREDIT POINTS MADE BY STUDENTS RANKING AT VARIOUS LEVELS ON THE INTELLIGENCE TEST

Groups compared	Various percentile levels				
	Highest 10 per-centile	Highest 50 per-centile	Lowest 50 per-centile	Lowest 10 per-centile	Cases counted
Working boys.....	25.00	16.46	10.50	12.50	303
Non-working boys.....	25.50	21.87	10.66	4.50	179
Working girls.....	31.50	22.68	10.37	10.34	207
Non-working girls.....	30.00	26.07	17.83	8.00	205

¹ The number of credit points earned by students at Indiana University is figured by the Deans on the basis of the academic record or grade made by the student in his college work. If he barely passes in his work; that is, makes only a "D" (65 to 74) on his semester's work, he gets his credit in the subject but no credit points. If he gets from 75 to 84 or a "C" on his work, he gets as many credit points as credits in the course. If he gets a "B" he gets 2 credit points for each hour's work in which he is enrolled. If he makes an "A" in the course, he would get 3 credit points for every hour's academic work he was doing. This means that if he were enrolled in 15 semester hours of work and made an "A" (95 to 100) in all his courses, he would earn 45 credit points during the semester.

the students who ranked at the highest and at the lowest levels on the Intelligence Test. This data shows that there is a direct correlation between the ratings made on this test and the academic success which these students achieved with their college work.

The same fact is shown in a negative way by the data given in Table XIX. As may be seen from an inspection of the figures given in the table, the students without any failures in their academic work for their first semester, if taken as a group, made the highest rating on the Intelligence Test, while the freshmen students who made the worst failure in their academic work made the lowest rating on the test. These and other facts are brought out by the data given in Table XIX.

TABLE XIX.—MEDIAN PERCENTILE RATING ON THE INTELLIGENCE TEST MADE BY THE FRESHMEN STUDENTS FAILING IN ONE OR MORE HOURS OF WORK IN THEIR FIRST SEMESTER

Groups	Number of hours failure made in first semester											
	None	1	2	3	4	5	6	7	8	9	10	11-17
Boys.....	60	70	47	47	47	49	40	33	34	20	33	30
Girls.....	60	52	47	40	40	40	38	38	32	36	36	20

There are, of course, other factors which help to determine the degree of success which a student will attain in his college work, such as his method of work, his mental attitude towards his tasks, his ability to read, the extent to which he has succeeded with his work in the past, how well he has adapted his working load to his mental ability, past successes and his physical strength. Some of these factors will be treated in the three chapters which follow. Others have already been discussed. But from the facts already presented, it is clear that certain adjustments should be made to these differences in the mental equipment of college students if they are to be given the kind of direction and help which they really need.

5. ADJUSTMENTS WHICH SHOULD BE MADE TO THESE DIFFERENCES IN MENTAL STRENGTH

Since marked differences in mental ability exist among college students, special care should be exercised: (1) in determining the student's working load; (2) in selecting the tasks which instructors assign them; (3) in the type of instruction given; and lastly (4) in evaluating their work. What adjustments are really made to these differences in mental endowment found among college students?

(1) *Working Load of the Brightest and Dullest Students Compared.*—In deciding upon their working load, no

consideration is now given either by the students or by the University officials to these differences in mental strength. Table XX gives the number of hours in which the freshmen students who rated at the various intelligence levels were enrolled in the University during the first semester of the present (1926-27) academic year. As the figures show, very little difference is found between the amount of academic work taken by the brightest and by the least capable students. In the case of the working girls, the least capable are enrolled in the most hours of academic work.

TABLE XX.—MEDIAN HOURS ENROLLMENT OF STUDENTS RATING AT DIFFERENT LEVELS ON THE INTELLIGENCE TEST

Student groups compared	Various percentile groups							
	Highest 10th percentile		Lowest 10th percentile		Highest 40th percentile		Lowest 40th percentile	
	Enrollment	Cases	Enrollment	Cases	Enrollment	Cases	Enrollment	Cases
Working boys....	16.20	30	16.06	24	16.14	124	16.06	130
Non-working boys	16.21	14	16.16	11	16.66	74	16.33	73
Working girls....	15.67	14	15.85	14	16.01	87	16.01	85
Non-working girls.	16.38	20	16.25	10	16.25	106	16.07	70

Another factor involved in making up a student's working load is the work he does in addition to his college or academic work. As previously shown, 65.9 per cent of the boys and 50.4 per cent of the girls in this year's freshmen class were doing some outside work to help make their way through the University, and this is typical for the other two years studied. But no distinction is made between the students ranking at the higher and lower levels on the intelligence test either in their enrollment or in the amount of outside work which they are permitted to do in addition to their University work. Those doing from 1 to 60 hours of work on the outside to help defray their expenses in college are enrolled in practically the same number of hours in the University as those who are doing no outside work. It is also true that the students who work, take on their working load, in the university and on the outside, without any regard to their mental equipment or physical strength. One student ranking at the 12th percentile level on the Intelligence Test was enrolled in 17 hours of University work and his working schedule showed that he was attempting to work 64 hours per week on the outside. Table XXI shows the median number of hours of outside work done by the working students who ranked at various levels on the Intelligence Test. It should, however, be remembered that such averages give only a partial view of the important facts

which our distribution tables and correlation surfaces revealed in regard to individual cases.

TABLE XXI.—MEDIAN NUMBER OF HOURS DEVOTED TO OUTSIDE WORK BY THE WORKING STUDENTS WHO RANKED AT VARIOUS LEVELS ON THE INTELLIGENCE TEST

Groups compared	Various percentile levels				Cases
	91-100	51-90	11-50	0-10	
Boys.....	13.5	9.7	6.4	8.3	345
Girls.....	8.0	7.5	6.5	9.0	209

Table XXII gives the median hours of enrollment of the students who are spending various amounts of time on outside work and shows that the enrollment of the working students is practically the same as for

TABLE XXII.—MEDIAN HOURS ENROLLMENT OF THE STUDENTS WHO WORK AND OF THOSE WHO DO NOT

Groups compared	Median hours of enrollment		Cases	
	Boys	Girls	B.	G.
Students not working.....	16.55	16.18	178	210
Students working from:				
1-10 hrs. per week.....	16.10	16.20	150	116
11-30 hrs. per week.....	16.22	15.85	160	74
31-70 hrs. per week.....	16.23	16.20	33	13

the non-working students; also that the students who are spending as much as 30 to 70 hours per week on outside work are enrolled in as much academic work as those who do not need to do *any* outside work.

It is evident from this data that one dominant cause of failure among college freshmen is the fact that too little attention is given to the problem of adjusting the students' working load to their mental ability and strength and to the habit of success that has already been established by the student. Many of the working students and those less fortunately endowed are too heavily loaded, to enable them to succeed as we shall later point out in detail. Those most fortunately endowed are, as a rule, not given any more work to do than those who must drop out of the university at the end of their first semester because they lack the ability to do the work in a manner that is satisfactory to their instructors.

(2) *Faculty Requirements the Same Regardless of the Mental Equipment of Students.*—It is also worthy of note that no difference is made in the tasks that are ordinarily assigned to these students by their instructors. At the present time no attempt is made to secure results from Indiana college students which are commensurate with their ability. The weakest students are gradually weeded out of the classes and out of the University, because they can not do the work. Results obtained in a two year study of this problem

by Mr. E. L. Yeager, a member of the Psychology staff, show that only 12 per cent of the freshmen boys and 16 per cent of the freshmen girls who enter the University and rate at or below the 25th percentile level on a standard intelligence test do work that is satisfactory to their instructors.¹ As a natural result these students are forced out of the University during their freshman year. But what is more significant still is the fact that the brightest students are not required to do any extra work. They are enrolled in 16 or 17 hours of work and are not required to do more than an average quality of work. In fact, they are not permitted at Indiana University to carry extra work during their freshman year. As a result, they are too often doing less than they can and so are forming the habit of doing less than their best. These and other important facts are shown by the data presented in Tables XX to XXII.

Our data further showed that the brightest students in the last three freshmen classes spent less time in study than did the students who ranked at the lower levels on the intelligence test.² This suggests that it

¹ It is also important to point out that 68 per cent of the girls and 78 to 84 per cent of the boys who rate above the 75th percentile level on the intelligence test never failed in any of their work, in any semester.

² This agrees with the findings of Mays' Study of 450 Liberal Arts Students at Syracuse University in 1923. See *Jr. Ed. Psy.* Vol. 14, p. 439.

is the brightest students in the University who are most poorly adjusted and the most inadequately taken care of. This result was verified by data obtained from private interviews with a number of students whose score on the intelligence test placed them at the 99th and 100th percentile level.

(3) *General Evaluation of the Students' Work.*—Since marked differences in mental endowment exist among any group of college students, results should be expected from these students which are somewhat commensurate with their ability. But every evaluation of the students' work that is now officially made by Indiana University and by most of its instructors fails to take these differences into account. Only the actual achievement or performance record of a student is considered in making up the list for *Phi Beta Kappa* and for the "*Cum Lauda*" degrees. No consideration is given to the students' capacities save as they may function in the making of a higher grade. If a student who rates at the lower levels on the intelligence test makes a "C" or a "B" grade in his work, he is given no more consideration or encouragement by his professors or by the University than a student rating at the 100th percentile level and making a similar standing in his work, notwithstanding the fact that the performance record indicated by these grades would probably be the highest possible success which the former student could attain, while the same grade

or performance record for the latter would represent a very poor grade of work for him because it indicates a type of work far below the best that he could actually do.

(4) *Adjustments Which Can and Should Be Made to These Differences in Mental Endowment.*—Definite administrative and instructional adjustments should, therefore, be made to the differences in mental strength found among college students. The working load of all students should be adjusted more nearly to the students' mental ability and health. If this were done, the brightest students in the University would not be encouraged to form habits of laziness but would be required to make the most of their abilities, and so conserve their superior talents for themselves and the world.

An easy adjustment which any college or University could make would be to let the superior student enroll in more than the average amount of work, if his high school record shows that he has developed ordinary habits of succeeding with his work. Professors might also use the ratings made on a reliable intelligence test to guide them in evaluating the work of their students more justly and accurately. If this were done, students with inferior ability, as college students go, could be specially commended if they were doing average or passing work, while the brightest students

in the group would be expected to do the superior quality of work of which they are capable.

The best adjustment would, of course, be some such scheme of dividing students into sections on the basis of mental strength as is now in vogue in a number of universities. The writer believes that all administrative problems involved in making suitable adjustments to these important differences in mental endowment could easily be worked out if once the need for such adjustments was clearly enough seen and felt.

CHAPTER VIII

HOW WELL COLLEGE STUDENTS CAN READ¹

It has been estimated that college students get about ninety per cent of their facts from books and the reading of scientific reports. Whether or not this estimate is correct may be questioned, but all will agree that most of the information secured by college students comes either directly or indirectly from books. A student's success in every subject studied in college depends, therefore, very largely upon his ability to read or to get facts accurately and quickly from books.

It should also be pointed out that the type of reading which a college student must do consists of more than simply noting and comprehending what an author says. Every student must in addition be able to interpret or evaluate the facts which he obtains from his reading. He must be able to pick

¹ The data presented in this chapter and in Chapter XIV of this book were published in *School and Society* for August and October, 1927. The author wishes, therefore, to express his appreciation to the Editor of this Journal for permission to include it here.

out the most important points made by the author read. He must organize and assimilate these facts in such a way that he will be able to use the information so obtained in his thinking and other work. How well can college students do this type of work, or stated in the usual way, how well can they read?

While working with two Orientation classes at Indiana University in the fall of 1926, the writer found that the students in these sections—who for the most part had been found unable to do their university work in a satisfactory manner—were very deficient in their ability to read and had to be given special help on learning to read more effectively before they could succeed with their academic work. His experience with these young people clearly showed that the difficulties which they were encountering with their work were chiefly due to their inability to read and to wrong methods of work.

As a result of this discovery, the writer undertook not only to improve their skill in reading and their methods of work, but attempted to ascertain the reading ability of college students in general, and to ascertain how far their deficiency in reading was responsible for the academic failures found among college freshmen. He was also interested in trying to determine to what extent these deficiencies in ability to read might be removed by special instruction given in a "How to Study" course.

To determine how well college students could read, two types of reading tests were given the entire freshmen class at Indiana University in February 1927.¹ The same tests were later given to 214 sophomore and junior students divided about equally into a training and a control group. To measure the ability of these young people to note and comprehend what was being read, they were given the Whipple Reading Test for College Students, Form A. To measure their ability to master a standard assignment in a text, such as is regularly given by their instructors, a special test was devised by the writer which required the readers, not merely to note and comprehend what was read, but to select and evaluate the important points made by the author, to organize and fix these points in mind so well, by relating them to what they already knew, that they would be able to recall and use this information in any way that their instructors might require on the following day.

¹ In the giving of these tests and for working up the results, the writer is indebted to Roy H. Stockrahm who was making an investigation under the direction of the writer of "Learning to Read" for his doctor's degree. He helped give the tests to the freshmen class, worked up the results and will include the data from these freshmen tests as a part of his thesis report. The writer wishes, therefore, to acknowledge his indebtedness to Mr. Stockrahm for his suggestions and help, for without his assistance this study could not have been made in its present form.

The results of both these tests clearly showed that the ability of college students to do these two types of work—plain reading and mastering an ordinary reading assignment—was far too meager to enable many students to do satisfactory work. Marked individual differences in the ability to do these two types of work were found among all groups of college students. In fact, the ability to read of most of the students tested was found to be so deficient that we have little right to expect them to succeed with their academic work until this deficiency is made up.

1. DEFICIENCIES FOUND AMONG COLLEGE STUDENTS IN ABILITY TO READ

On a certain Tuesday, after the students had become thoroughly adjusted to their second semester's work, all the freshmen taking English 1 were given a standardized assignment to be prepared for the following Thursday. They were told by their instructors when this assignment was made that they would be tested on the contents of this chapter at the next meeting of the class. They were also directed to keep track of the amount of time they devoted to the study of the chapter. The subject of the assignment to be read was "How to Make an Investigation or Critical Study of a Particular Subject or Problem" and included a statement of how to write up the

results of such a study in the form of a final report. This assignment and the questions to be asked on its contents had been previously standardized. On the following Thursday these freshmen were therefore examined on this assignment by the writer and other members of the Psychology teaching staff. The first question asked on this test was: "When did you study the assignment?" The second question read: "How much time did you devote to the study of this chapter?" In the next question the students were asked to state the subject of the chapter or the problem discussed by the author in the assignment they had been asked to read. The other questions called for the principal points made by the author in the chapter they had studied. After these questions had been answered, the Whipple Reading Test for College Students was given, and the results from both these tests carefully collaborated and studied.

Full and reliable reports on both these tests were obtained from 900 freshmen and 214 upper classmen. The procedure in the study of the standard assignment was slightly varied for the upper classmen. Instead of the chapter being assigned one day for a test on it at the next meeting of the class, these upper classmen were given thirty minutes to read and study the assignment, after which they were tested on their knowledge of the contents of what they had read.

This kept the amount of time devoted to its study uniform for the older students, whereas the freshmen were left free to put in all the time on the preparation of the assignment desired.

Only a few of the most important facts shown by our results can be presented in this report. It was found in the first place that only 27 per cent of the 485 freshmen boys tested and 39 per cent of the 415 girls could give the title of the chapter they had studied in preparation for the first test, or formulate the chief problem discussed by the author read. The median score or percentage of efficiency made on this test was only 34 for the freshmen boys and 43 for the girls. That is to say, the average freshman boy belonging to the groups we tested was able to note and master, in his reading, only 34 per cent of the important points which the author had made. The score was slightly higher for the girls, who noted and mastered 43 per cent of the points which the author made.

What is still more important than this general level of ability of the total group is the marked variations in reading ability found among the individuals composing our groups. The poorest readers among the freshmen girls and the poorest readers among the boys were able to note and remember only 3 per cent of the points which the author had made. The best readers among the boys got 85 per cent of the points in their reading; the ablest readers among the girls got 94

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per cent of the total points made by the author in the assignment they had read.

In two "How to Study" classes, composed mainly of sophomore students, 60 per cent of the important points made in the chapter were noted and remembered well enough to report them at the next meeting of the class. This was before any special instruction had been given them. In another "How to Study" class, composed of more advanced students, the average per cent of efficiency in reading for a class of 35 was 63.¹

But what seems still more significant is the individual variations in reading ability that were found among the members of these two groups. In the sophomore class, the poorest reader in the group was a boy who ranked at the 76th percentile level on the Intelligence Test. By taking into account both his

¹ This rather marked difference in score between the freshman and "How to Study" groups is due partly, no doubt, to the fact that the students in the "How to Study" classes were mostly sophomore students, mainly to the fact that some of the freshman students did not study the assignment as conscientiously as the "How to Study" groups, for whom the material read constituted the regular assignment for the day. It should, however, be added that the "How to Study" classes did not know before hand that they would be specially tested on this particular assignment. The freshmen did. But even for the freshmen the figures probably represent the kind of work which these students regularly do in preparing their assignments and is therefore very pertinent to the point at issue in this study.

rate of reading and the accuracy with which he read, it was found that another boy in the same class who rated at the 74th percentile level on the Intelligence Test could read, or do this type of student work, about seven and one-half times as well as the former boy. That is to say, the ratio of efficiency in reading for the boy who rated at the 76th percentile level on the Intelligence Test was only .35. The ratio of efficiency per unit of time for the best reader in the class was 2.52. These ratios were obtained by dividing the percentage of efficiency made on the test as a whole by the total amount of time spent in the reading or study of the assignment. This gave the reading efficiency of each student per minute of time. Calculated on this basis, the best reader in the class was seven and two-tenths times as good as the poorest reader in the class, although both boys ranked at about the same level on the Intelligence Test.

In a class of students who were more advanced in their university standing (an Indianapolis Extension class), it was found that the best reader in the class, a graduate student, was 17.1 times as good as the poorest reader in the class. That is to say, the ratio or reading efficiency per unit of time of the best reader in the class was 17.1 times as large as the ratio for the poorest reader in the class.

If we take into account merely the matter of comprehension, or ability to understand what is being

read, as measured by the Whipple Reading Test, the same wide differences were found among the individuals of the various groups of students we tested. On the Whipple Reading Test, the best reader among the freshmen boys got 19 times as many points correct as the poorest reader in the group. That is to say, he got 19 points correct out of a possible twenty, while the worst reader in the group got only one of the twenty points correctly reported. The best readers among the girls got six times as many points as the poorest readers in the freshman class. On this basis of comparison, the best reader among the boys was twice as good as the median or average for college freshmen, and the best girls were 1.8 times as good as the median for the freshmen girls; the poorest reader among the boys was only one-tenth as good as the median for the freshmen class. The poorest reader among the girls was only one-third as good as the median for all the freshmen girls.

The same marked differences appear if we compare the rate of reading. The median rate for all the freshmen boys was 74.5 per cent. That is to say, they got over this much of the passage to be read in the time assigned to the test. The girls read somewhat slower, covering only 72.2 per cent of the passage. But the slowest reader among the boys was able to get over only one-fifth of the passage. The slowest girl read only one-third of the passage, while

7.5 per cent of the total group read the whole passage in the time allotted to the test.

Still greater variations were found in the *accuracy* with which these students read the standardized passage used in the test, showing how well they were able to note and comprehend what the author had actually said. One boy got only one point right when he was tested on twenty. The best reader got 19 right out of a possible twenty, all he got over in his reading. The median for the 485 freshmen boys who took the tests was 10.2 points or 50.8 per cent. The range in accuracy for the 415 girls was not quite so great. The poorest reader among the girls got only three points right out of a possible 20. The best reader among the girls got 18 points right out of a possible 20. But the *median* score for the girls was 10.65 points or 53.16 per cent of the total passage to be read. The variations in rate and accuracy combined ranged from five to ninety-five per cent for the boys, and from fifteen to ninety per cent for the girls.

2. RELATION BETWEEN ABILITY TO READ AND ACADEMIC SUCCESS

When we consider these variations in ability to read and the low level of efficiency of the total group, it is clear why many students fail to do satisfactory work in their college courses. Some are so deficient in their

ability to get the points made by the authors they read and from whom they must get the facts to be learned, that we have little reason to expect success from them until this deficiency is successfully made up.

How much a student's ability or inability to read has to do with his academic success is indicated by the data contained in Tables XXIII and XXIV, which show the median number of credit points made during their first semester by the freshmen students who made the best and the poorest scores on the reading tests.¹ From an inspection of these data it will be

¹ At Indiana University a student's scholastic success as previously pointed out is officially measured on the basis of "credit points" which indicate far more accurately than "credit hours" or number of credits made, the quality of the academic work which a student does during any semester. For example, if a student makes an "A" grade (95-100 %) in a five-hour course, he would make 15 credit points in this course. If he made a "B" (85-94 %) in a three-hour course, this number of credit hours would be multiplied by two. If he made a "C" (75-84 %) in the course, the number of credit hours would be multiplied by one. In other words, he would make as many credit points in the course as credit hours. If he made a "D" (65-74 %) in the course, he would make his credit but no credit points. It will, therefore, be seen that a student might make all "D's" in 15 hours of college work and make no credit points at all; whereas, if he made an "A" in every course, he would have made 45 credit points. This measure was taken instead of the number of credits made because it indicates more accurately the quality of the academic work which our students did.

seen that there is a close relationship between ability to read as measured by the tests used in the present experiment and the students' academic success. Taking the freshmen group as a whole and calculating the number of credit points made by those who rated at the various levels on the reading test, we find a steady decline in the number of credit points made as we pass from the group of students who made the best ratings on the reading test to the group that made the poorest record on these tests. This was true for both the boys and the girls. That we do not find a perfect correspondence between these two types of performance is, of course, due to the fact that many other factors besides inability to read interfere with a student's success in his college work.

TABLE XXIII.—MEDIAN NUMBER OF CREDIT POINTS MADE BY STUDENTS POSSESSING THE GREATEST AND LEAST AMOUNT OF SKILL IN READING (I.U. TEST)

Groups compared	Per cent of efficiency in reading				Total cases
	75-100	50-74	20-49	1-19	
Boys.....	33	22.60	17.20	11.20	335
Girls.....	32	24.64	18.13	10.80	338
<i>Cases</i>					
Boys.....	7	52	191	85	335
Girls.....	12	117	180	29	338

TABLE XXIV.—MEDIAN NUMBER OF CREDIT POINTS MADE BY STUDENTS POSSESSING THE GREATEST AND LEAST AMOUNT OF SKILL IN COMPREHENSION IN READING (WHIPPLE TEST)

Groups compared	Per cent of efficiency in comprehension				Total cases
	75-100	50-74	20-49	1-19	
Boys.	19.18	15.14	11.50	.....	353
Girls.....	24.30	17.63	14.25	.....	338
<i>Cases</i>					
Boys.....	132	184	37	.....	353
Girls.....	149	160	29	.....	338

The data contained in Table XXIII clearly show that accurate and ready comprehension of what is being read has much to do with a student's success in his college work. That a student may be able to comprehend what an author says and yet not be able to evaluate, organize, assimilate, and use this information in the ways which his instructors demand, is indicated by the fact that many students who made a comparatively high score on the comprehension or *pure* reading test, make a relatively poor showing on their college work. It is also important to point out in this connection that there was a higher correlation between the records made on the I.U. Reading Test and academic success than was found between the

ratings made on the Whipple Test and the number of credit points which these same students made in their university work. The correlation surfaces for the Whipple Test and the number of credit points made in the first semester by our total freshmen group, clearly showed that many students who were good in comprehending what they read were nevertheless unable to do their college work in a satisfactory manner.

Such failures in one's college work may, of course, be due to the fact that he has formed the habit of failing with his work, or that he does not apply himself consistently enough to his tasks, or that he is unable to do the kind of reading that is demanded by his instructors. Our results do not enable us to answer which of these factors was most responsible for the failure; but the fact that the correlation between the results of the I.U. Reading Test and academic success was higher than between the score made on the comprehension test and the number of credit points made, suggests that these failures were largely due to the latter cause. It is also important to point out in this connection that all but 14 of the freshmen girls who got a score of over 50 on the I.U. Test made 15 or more credit points in their first semester's college work, while 35 of the girls who got this rating on the *Whipple* Test made less than 10 credit points, and thirty others made less than 15 credit points.

These data show pretty conclusively that the ability to read rapidly and effectively has much to do with a student's success in college, and that many freshmen students do not possess sufficient skill in the art of reading to enable them to succeed with their academic work.

3. NEED FOR SPECIAL REMEDIAL INSTRUCTION AMONG COLLEGE STUDENTS IN LEARNING TO READ

With such marked variations in the ability to read, and with such deficiency in one of the most important tools which students must use to get their facts, it would seem that college students should be shown by actual measurements how inefficient they really are in this respect. This should be followed by instruction which will show them what they must do to improve their ability to get an author's thought from a printed page, not only in a more effective way, but in the shortest possible time. They should also be shown how they may measure for themselves the gains they are making in learning to do this type of work.¹ College students have really not been helped with the problem of learning to read much, if at all, since they were in the elementary grades, and have not

¹ For concrete suggestions on how this may be done for High School and College students see W. F. Book, "Learning How to Study and Work Effectively," Ginn & Co., 1926, pp. 302-306 and 339-356.

been able to work it out satisfactorily for themselves. As a result, they do not know what the nature of their deficiency along this line really is, or what they must do to correct it. Some remedial instruction must therefore be provided before they will be able to do their college work in a more satisfactory way. To what extent can such instruction be given?

4. AMOUNT OF IMPROVEMENT MADE IN "LEARNING TO READ" BY FOUR GROUPS OF COLLEGE STUDENTS

In two "How to Study" classes conducted at Indiana University by the writer this year, a group of 54 students were shown by actual measurement how deficient they were in their ability to read. They were then instructed in a way which showed them just what they must do to remedy this defect, or to improve their ability to read. They were also given some directions in regard to how these things could best be done. They were then urged to apply these things to the reading done in preparing their assignments in other subjects. To insure that these instructions were clearly understood and actually put to use, the instructor carefully tested their ability to use the information given them in the following ways. First, their present ability to read was carefully tested before this instruction began. At two succeed-

ing intervals, four weeks apart, these classes were again tested to measure the advancement they had made in improving their ability to prepare an assignment in a text. The results made on each of these tests were then compared with the score made on a similar test given before any instruction in learning to read more effectively and rapidly was given. Four regular 50 minute periods were devoted to the giving of this instruction. During four other 10 minute periods these students were quizzed and checked up on their ability to apply the suggestions given them in the references assigned on the problem, and in the instructions given in class. In these special discussion periods some member of the class was selected as an example, and asked to tell how he had proceeded in preparing his assignments the evening before. The other members of the class were then asked to correct this procedure and to show how it might be improved upon as shown by their own experience and study of the problem. Definite instructions on "learning how to read" were also given them in the text book used in the "How to Study" course.¹ All these helps they were urged to use continuously in preparing their reading assignments from day to day.

As already stated, the ability of these classes to prepare a standardized assignment was measured

¹See W. F. Book, "Learning How to Study and Work Effectively," Chapter XVII, also pp. 302-306.

twice after this special instruction was given. The first time, four weeks after the instruction was begun, and again near the end of the semester. In each of these follow-up tests, a standardized assignment was used that was purposely made a little longer and judged to be a little more difficult than the assignment used in the former test. All these tests were given at a time when the students did not know the test was coming. In each of the tests, the percentage of efficiency for each student and for the total group was calculated by dividing the total number of points he got correctly answered on the test by the total number to be answered. The students were also asked in each test to state the total amount of time which they spent in preparing the assignment so that their reading efficiency per unit of time could be determined for comparative purposes. This ratio was determined by dividing the per cent of efficiency for the assignment as a whole by the total time spent on its study.

The results for the two "How to Study" classes are given in Table XXV and show that the reading efficiency of these two groups of students was improved, during the semester, 102 per cent; also that their ability to master a standardized assignment had improved from 60 to 97.3 per cent. Some individual students improved their reading efficiency as much as 250 per cent. A few were fairly efficient in reading when the instruction began.

TABLE XXV.—GAINS MADE IN LEARNING TO READ BY TWO
HOW TO STUDY CLASSES

Tests	Average per cent of efficiency	Efficiency ratio or average efficiency per unit of time	Cases
In first test.....	60.	1.06	54
In second test.....	84.1	1.84	
In third test.....	97.3	2.14	
Per cent of improve- ment.....	37.3	102.00	54

The above experiments were made during the first semester of the present (1926-27) academic year. During the second semester some less formal instruction on the different purposes which one might have in mind while reading a passage was given to two other groups of students enrolled in a course in Educational Psychology under the writer. These 112 students were shown how one should proceed to master his assignments in the most effective way, because it had been found in previous semesters that the students who regularly enrolled in this course were very deficient in their ability to master the assignments given them in their texts. The members of these two Educational Psychology classes were also shown how to conserve their time, how to plan their work as students and prospective teachers, how to develop a

greater interest in their tasks, somewhat along the line of the instruction given in the special "How to Study" course recently organized at Indiana University to help students improve their methods of work.¹

Near the end of the semester, and about twelve weeks after this instruction had been given, the members of these two classes were asked if they really felt that they had been benefited in their work as students by this instruction and if they had, to indicate on a scale of from 1 to 100 per cent how much they felt they had been helped. No names were signed to these reports, and every individual in both classes except one said that he had been assisted in his work by this instruction. The average of the estimates of the 112 students so tested was 32 per cent.

Toward the close of the semester these same two Educational Psychology sections were given the same two reading tests that were used to test the freshmen and the two "How to Study" classes. The ratings made on these tests were then compared with the scores made on the same tests by two other Psychology classes about equal in number (109 students) and of the same general college standing, but who had not had the type of instruction in Learning to Read described above. A comparison of the ratings made

¹ In all, about six regular recitation periods were devoted to this instruction, with considerable follow-up work done by means of personal conferences and in discussion groups.

on the I.U. Reading Test by these two groups of students showed a marked improvement for the Educational Psychology sections who had had some help on "learning to read." The percentage of efficiency in reading of these two training sections averaged 69.5, whereas the average per cent of efficiency in reading for the control groups who had not received any instruction on the problem of "learning how to read more effectively and rapidly," averaged only 59.2,—and this when the ratings made on the Intelligence Test happened to be several points higher for the control group than it was for the practice group.

It therefore seems clear that much concrete help could be given to college students, not only in solving the problems encountered in learning to read more effectively, but in improving their methods of work along other important lines. We conclude that the reading ability of college freshmen should be accurately determined; that special remedial instruction should be given to all who are found to be deficient in this regard; that this instruction should be given in a special Orientation or "How to Study" course, and given by an instructor who is specially interested in the work and well equipped to give the type of help which these students need.

CHAPTER IX

CONDITIONS UNDER WHICH COLLEGE STUDENTS DO THEIR WORK

As every one knows, the objective conditions under which one works have much to do with his success; first, because the extra stimuli which come from one's surroundings tend to take one's mind off of his work. Second, because these extra stimuli consume much energy that should go into the work.¹ In the case of children, the former set of conditions alone, if unfavorable, reduces their output of work about 40 per cent.

1. OBJECTIVE CONDITIONS UNDER WHICH COLLEGE STUDENTS WORK GENERALLY FAVORABLE

In order to obtain some facts in regard to the conditions under which our groups of freshmen students were working, they were asked if "the conditions where they lived were favorable for effective study," and if not, to state why they were unfavorable. Eighty-

¹ Compare W. F. Book "Learning How to Study and Work Effectively," Chapter XV, pp. 281-306. Ginn and Co., Boston, 1926.

nine per cent of the freshmen girls and ninety-three per cent of the boys stated that the conditions in their fraternity homes or study rooms were favorable.¹ Our interviews with a large number of these students showed, however, that few realize what it takes to make the objective conditions truly favorable for work.

Our data further showed that few habits which make for greater efficiency along this line are being established, such as developing a time and place habit for study. They also showed that too little attention is given by college students to securing suitable equipment in the way of supplies and books;² and that no attention whatever is being given to the problem of improving their methods of work by making a systematic analysis of their tasks. When asked to name the most serious difficulties which they had to overcome as students, 63 per cent of the boys and 71 per cent of the girls stated that it was their inability to concentrate upon their work and to remain concentrated upon their tasks. And while our detailed study of the methods of work of these students convinced the writers that the latter were chiefly responsible for this

¹ It should, however, be stated in passing that special care is taken by all the Fraternities and Dormitories to make the objective conditions as favorable as possible, especially for the freshmen students.

² Some college students at Indiana University never buy a text book of their own for some of their courses.

lack of concentration, it is true that the trouble would be greatly reduced if the objective conditions were made and kept as favorable as possible.

2. SOME ENVIRONMENTAL CONDITIONS WHICH PREVENT EFFECTIVE WORK

The reasons given by the students who complained that the conditions in their rooms were unfavorable for study are, in order of importance, as follows: "Too much noise," "interruptions by others," and "too many in the room." Other reasons given were: "constant use of the telephone, too much music, no sun in the room, room dismal, poor table, too many fraternity duties, poor ventilation, crowded living conditions, quiet hours not well kept, annoying baby, etc."

Because of their detrimental effect on establishing proper habits of thought and work these hindering conditions should be removed as speedily as possible. College students should also be made to see how important for their success this set of conditions is and be shown how to make them most favorable for their work.

CHAPTER X

STUDENT IDEALS AND SOME DIRECTIVE FORCES WHICH DOMINATE THEIR LIVES AND WORK

The ability to succeed with one's tasks in college and in later life depends upon a number of things in addition to those that have already been called to the reader's attention in earlier sections of this report. Among these added factors may be mentioned: (1) the character of one's ideals or motives and plans, and the strength and consistency of his desire for their realization; (2) one's past successes or the extent to which the habit of success has already been established; (3) one's general method of work or the ability he has acquired to use his energy and time successfully when confronted by his tasks; (4) one's working load and how well he is able to adjust it to these and the other factors which determine one's ability to succeed with his tasks and work. Certain facts pertaining to all these factors were ascertained in the present investigation and will be briefly described in the remaining chapters of this report.

1. DOMINANT MOTIVES OF UNIVERSITY STUDENTS

Recent investigations have shown that success in learning and in human life depends to a marked degree upon the character and strength of one's purposes or ideals and upon the incentives that are provided by our surroundings and work.¹ These serve as a sort of inner urge or drive and determine not only how hard a student will work but the direction which his energy or acts will take. They also affect the persistence of the effort which one puts into his work.

These inner urges may of course be temporary or more or less permanent forces in a student's life. They may be native like the unconscious desire for life or food, or they may be acquired like one's interest in History or Geometry; but however induced, they help to determine what a student will do and the degree of success which he will achieve in his work and in later life. It is important, therefore, to determine what motives are dominating the reactions of college students today and the ideals that are directing their thoughts and acts.

With a view of trying to determine the more important motives which influence the behavior of students

¹ W. F. Book and Lee Norvelle, "The Will to Learn," *Ped. Sem.* Vol. XXIX, pp. 305-362. Also W. F. Book, "Learning to Study and Work Effectively," 1926, pp. 308-335. H. D. Kitson, "A Study of the Output of Workers under a Particular Wage Incentive," *University Journal of Business*, Vol. 1, pp. 54-68.

coming to Indiana University, a study was made last year by Carroll D. Whitmer, a graduate student in the Department of Psychology, in which he tried among other things to determine what induced these young people to come to the University.¹ He studied the motives of those who obtained the best and the poorest rating on the Psychological test, the dominant motives of the men and the women students, and of the freshmen and older student groups. By means of carefully arranged interviews he tried to ascertain the relative strength of the different kinds of motives that were dominating the lives of the students he studied; also where and how these ideals had been obtained.

His results are significant because he obtained data which showed the character, source, and relative strength of the motives of 3151 college students, 1733 men and 1418 women.

According to the data he obtained, the Vocational motive was dominant for both the men and the women. Fifty-seven per cent of the motives mentioned by the men and sixty-three per cent of those expressed by the women were in terms of some specific vocational aim. Twenty-six per cent of the men and twenty-two per cent of the women combined the Vocational with

¹ A Master's thesis finished in June 1926. The writer is indebted to Mr. Whitmer for the materials taken from this report.

an Educational aim, stating that they came to the University "to secure a better position in the business world and to be able to live a more cultured life;" or "to enable me to make a good living, and to educate myself so that I may live a better life and be of the most service to humanity." If these be added to the expressions which were purely Vocational in character, we have eighty-three per cent of all the students expressing a definite Vocational motive as their chief reason for coming to the University. The other seventeen per cent expressed a motive which Mr. Whitmer called Educational, Social Service, or Religious.

The new and older students coming to the University from other colleges had this Vocational motive more dominantly developed than the freshmen. And the girls seem to be dominated more by a vocational motive than the boys. It is also significant that the students who ranked highest on the Intelligence test had this Vocational motive more definitely and strongly in mind than those who rated at the lower levels on this test.

Mr. Whitmer's intensive case study of a special group of typical men students belonging to the sophomore, junior, and senior classes, confirmed the results he obtained by his study of the data gathered from the personnel and questionnaire blanks. It showed that their chief interest was in making a living. His study

also showed how and when these students obtained the major interests which dominate their conduct and life. Thirty-six per cent of the young men he interviewed got their dominant motives from their father or from relatives; twenty per cent obtained them through observing the successes of others; twenty per cent by working in a business or profession. Only eight per cent obtained them through their college work; and eight per cent through their high school work or from advice given by their superintendents or teachers.

More than a third of these young men (36 per cent) said they had had these interests since boyhood; thirty-six per cent got them in high school; twenty per cent got them after coming to the University; eight per cent seemed to have no dominant motive at all.

In his discussion of the results, numerous examples are given of the effect which a worthy motive has upon a student's academic success, also the results that were obtained by the students who did not have a definite motive to direct their activity and life. The students without a dominant motive to direct their energies and thought, Mr. Whitmer found doing very poor or failing work, regardless of their ability. Those with a strong and definite motive were succeeding in their work.

This latter fact illustrates a well-known principle governing human behavior in every field. Success in

college and in after life, depends fundamentally upon the character of one's purposes and plans, and upon the strength and constancy of his desire to attain what he plans for and wants. For this reason every fact obtained in the present investigation that throws further light on the character of the ideals which serve as directive forces in the life and work of college students today is important and should be clearly set forth. Unfortunately, only a few facts bearing directly on this problem were obtained in the present study.

2. NUMBER OF FRESHMEN STUDENTS WHO REGULARLY ATTEND CHURCH

The dominant motives of the students whose methods of work were studied in the present investigation are indicated by their attitude towards religion and the church, by the large number who are working their way through college in part or as a whole, by the time which these freshmen students devoted to study and other useful pursuits, and by the number who are pursuing a well-directed course of study with a definite objective in mind as has already been pointed out by our review of Mr. Whitmer's results.

The working schedules made out by all freshmen students to show how they spent their total time during a normal week, revealed the fact that most freshmen students go to church at least once every Sunday. According to these schedules 81 per cent

of the girls and 59 per cent of the freshmen boys regularly attend church.¹ But what is of still greater significance is the fact that the brightest of these students go to church in larger number than do the freshmen

TABLE XXVI.—PER CENT OF FRESHMEN STUDENTS RANKING AT DIFFERENT LEVELS ON THE INTELLIGENCE TEST WHO GO TO CHURCH

Groups compared	Per cent of the group who go to church		Cases	
	Boys	Girls	Boys	Girls
1. Those ranking at or above the highest 10th percentile level.....	71	85	44	34
2. Those ranking in the next 15th percentile group.....	61	83	45	62
3. Those ranking in the middle 50th percentile group.....	57	81	160	185
4. Those ranking at the 10th to 25th percentile level.....	55	79	53	41
5. Those ranking in the lowest 10th percentile group.....	51	75	41	16

¹ That this is probably a true picture of the situation as it actually exists at Indiana University is shown by the fact that our data was collected at different periods throughout the year: in 1926 about seven weeks after the opening of the semester; in 1925 near the close of the first semester; in 1924 about the middle of the second semester.

students who rated at the lower levels on the intelligence test. This is clearly shown by the data given in Table XXVI for this year's (1926-27) freshmen class, which is typical.

It was ascertained that some of the fraternities and sororities urge their freshmen students to attend some church, making it obligatory in a few instances. This might account for the large percentage of freshmen students who go to church. But the fact that a larger percentage of the *brightest* students go to church cannot be explained on this basis. The interest of these brighter students in religion, and in the social institution of the church, seems to be an indication of the character of the ideals which are dominating their conduct and lives. It would be interesting to know whether or not these figures hold for upper classmen who attend Indiana University.

3. OTHER FACTORS INDICATING THE CHARACTER AND STRENGTH OF THE IDEALS HELD BY COLLEGE FRESHMEN

The purpose and determination of a large number of college students is further indicated by the fact that 65.9 per cent of the freshmen boys and over half of the girls are making a part or all of their way through college. One young lady came all the way from New Mexico because she had heard she could make her way through Indiana University by working, and she

has been earning all the money required to live and continue in college for the past three years. She is willing to forego all the social advantages and pleasures that such a course entails and do the extra work required, spending the extra time in college which this procedure requires, if only she can obtain the opportunity to get the training which she feels she needs to prepare her for what she wants most to do in life. Some boys spend as many as 50 to 65 hours per week on outside work in order to remain in college. They are willing to live in undesirable quarters, to economize on their meals, to cut down on their sleep, to forego all the social pleasures associated with college life merely to get a chance to remain in the University and to prepare for what they want to do. The fact that these working students are taking practically the same amount of academic work as the regular students, and that they do, on the whole, a better quality of work is proof of their stronger motives, of a greater interest in their work, and of improved methods of work which this desire for an education and grave necessity has enabled them to develop and use.

4. EVIDENCES OF A LACK OF PROPER MOTIVES AND DOMINANT PURPOSES AMONG COLLEGE STUDENTS

That the reactions and general conduct of college students are determined to a marked extent by the general social life of the school, by athletics, and the

stimuli which come from their surroundings rather than from some immediate or remote purpose or life ideal which gives direction and impetus to their lives, is shown by the character of their weekly schedules, by the aimlessness of their activities and plans, and by the amount of time which they waste each day and week. The latter, as has already been pointed out, amounts to about 4.5 hours per day for all the freshmen groups. Instead of utilizing their time and opportunities at college as a means for achieving certain definite results or to attain some definite purpose or goal, most of these students seem to be doing only so much work as is needed to get them by or to make a satisfactory grade. That this is undoubtedly the case is shown by the fact that the amount of time wasted is materially cut down for the students who are compelled to make their own way through college, and among the Vocational groups in the Professional schools, whose definite aim is directing their efforts more sharply and urging them on to greater and more continuous endeavor than is the case for the students who were found to be wasting the most time.

5. KIND OF HELP NEEDED BY COLLEGE STUDENTS TO ENABLE THEM TO UTILIZE THEIR IDEALS AS AN AID TO THEIR SUCCESS

Many other facts were secured which throw light both on the ideals which are dominating college stu-

dents today, and on the pragmatic effect which these motives exert upon the reactions of the student. To recount them all would take us too far afield. From the facts already presented, it is clear that college students need to be shown how one's motives and plans really affect his reactions in life, how they help him to succeed, how right ideals are usually acquired, how such purposes and plans should be utilized by them, and how one's immediate plans and his life purposes should be co-ordinated in order that this important directive and driving force in human life might be more successfully utilized in their life and work.¹

¹ Compare W. F. Book, "Learning How to Study and Work Effectively," Chapter VI, pp. 109-127, Ginn & Co., Boston, 1926.

CHAPTER XI

WORKING METHODS OF COLLEGE STUDENTS

In an earlier section of this report it was pointed out that the most important single factor in determining individual success was not one's mental endowment or his endurance and power to recover from the effect of his work, nor his ability to conserve his energy and time, but how well he had learned to use his energy, and his talents and time in doing the things that he is required to do, or that he plans to do in the course of his life and work. In the last analysis, one's ability to release and direct his energy aright, the power to select his tasks, and the ability to use all his energy and time in a successful way while doing his work is the crucial point in personal efficiency and success.¹ The

¹ We are here leaving out of account one's general intelligence or mental endowment and the amount of energy which he possesses. These are most fundamental of all and proper adjustments must be made to these elements of human success as has already been pointed out. But the greatest *Educational* problem consists of making the most of the capacities and talents we possess. For this the factors here enumerated occupy first place. Superior intelligence would probably enable one to make suitable adjustments to this group of factors unaided but even here it would be very wasteful.

ability to do this depends very largely upon one's methods of work, upon his attitude towards his tasks, upon the kind of planning he can do, upon the extent to which the habit of success has already been established, and upon how well one is able to adjust his working load to these and other factors which determine one's success in college and in later life.

1. EXTENT TO WHICH THE HABIT OF SUCCESS HAS ALREADY BEEN ESTABLISHED AMONG COLLEGE FRESHMEN

The general attitude which college students have towards their tasks and the extent to which the habit of success has already been established among the members of this selected group is pretty clearly indicated by the per cent of their enrollment which they satisfactorily complete, by the number of credit points which they make in their academic work, and negatively by the number of hours of academic work in which a failing record is made.

A study of the academic record of large numbers of students and graduates from universities located in every part of the world, and a comparison of their success in college with the success which they attained in later life, has revealed the fact that all of these students whose college and life records have thus far been compared, made about the same type of success

in later life that they made in their college work.¹ This fact emphasizes the importance of developing, while in college, the habit of succeeding with everything which one undertakes to do. For success in one's undertaking develops incentives and inner urges which are helpful in doing other things. And the development of the habit of failure in one department of one's work hampers him when working in other fields because it paralyzes his effort and prevents the ceaseless experimenting that must take place before new and better methods of work can be originated and final success in any undertaking attained. To what extent is the habit of success established among college freshmen?

In our attempt to answer this question, we shall first point out the per cent of enrollment that was satisfactorily completed by the working and non-working students which composed our total group; by those who rated at different levels on the Intelligence Test; and by the students who are carrying the heaviest and lightest academic load. We shall then give the number of credit points which each of these freshmen groups made during their first semester in college and lastly examine the number of hours of failure

¹ W. T. Foster, "The Administration of the College Curriculum," Houghton Mifflin & Co., 1911. Also W. F. Book, "Learning How to Study and Work Effectively," Ginn & Co., 1926, pp. 13-17.

reported by their instructors and recorded on the university books.

(1) *Per Cent of Enrollment Satisfactorily Completed.*—Not all college students succeed with their work as every one knows. But what the factors are that produce this failure is not generally known. That one's past failures or successes and his methods of

TABLE XXVII.—NUMBER OF HOURS OF ACADEMIC WORK CARRIED BY FRESHMEN STUDENTS DURING THE FIRST SEMESTER OF 1926-27

Hours enrollment	8-14		15		16		17		18-21		Completing semester work		Who withdrew	
Groups...	B	G	B	G	B	G	B	G	B	G	B	G	B	G
Cases....	13	17	33	19	310	307	122	60	4	9	482	412	41	10
Per cent..	2.7	4.1	6.8	4.6	64.5	74.5	25.2	14.5	.83	2.1	100	99.8	8.3	3.0

TABLE XXVIII.—PER CENT OF TOTAL ENROLLMENT SATISFACTORILY COMPLETED BY FRESHMEN IN THEIR FIRST SEMESTER

Hours enrolled	8-14	15	16	17	18-21	Cases completing work	No. who withdrew
Men.....	71	85	80	84	74	482	41
Women....	93	91	93	91	98	412	10

work have much to do with his success or failure in school and in later life is beginning to be recognized. Table XXVII gives the enrollment for all freshmen students who attended Indiana University during the first semester of 1926-27. Table XXVIII shows the per cent of this enrollment that was satisfactorily completed. Table XII on page 52 shows the per cent of working¹ and non-working students who completed their *total* enrollment in a satisfactory manner. This latter data is, perhaps, the best single measure of the extent to which our freshmen groups have already established the habit of succeeding with their work. As will be seen from an inspection of the data contained in Table XII, only a little over half of the freshmen students succeeded with *all* their work in a manner that was satisfactory to their instructors.

A more careful study of these data reveals the additional fact that the students who are enrolled in the most hours of academic work are succeeding relatively better than those who are enrolled in the smallest number of hours of work. Making a careful analysis of the data with this question in mind, it was found that the girls who were enrolled in less than 15 hours of college work completed only 93 per cent of

¹ Throughout this report the term "working" student refers to a student who, for financial reasons, must defray his expenses by working. "Nonworking" refers to those who do not have to do this outside work.

their total enrollment, whereas those who were enrolled in more than the normal number of hours of academic work (fifteen), completed 96 per cent of the work in which they were enrolled. The same tendency is found among the boys. The freshmen boys who, this year, were enrolled in less than 15 hours of college work completed only 71 per cent of their enrollment. Those enrolled in more than 15 hours of work completed 80 per cent of their total enrollment.

These data seem to show that the students who are doing extra work have the habit of success better established than the group that was enrolled in a minimum number of hours of university work. It is also significant that the students who are carrying the lightest academic load make the most failures and the fewest credit points, showing that the habit of failure was more strongly established among them than among the group that was attempting to carry a larger amount of work.

This result might at first thought be believed to be due to the fact that those enrolled in the largest number of hours of academic work had superior ability or that those enrolled in the fewest hours of academic work were deficient in health. But as was earlier pointed out, there is practically no difference in the ratings made on the Intelligence Test by those enrolled in the fewest and in the largest number of hours of academic work. (See Table XX, page 87.)

And it is the chronic failures who are, as a rule, enrolled in the fewest hours of work. We, therefore, conclude that the habit of success and the better methods of work which the students who are making the best success seem to have developed is responsible for their superior success, and emphasizes in no uncertain way the importance of one's methods of work and of establishing the habit of succeeding with everything he undertakes.

(2) *Credit Points Made by Indiana Freshmen.*—The extent to which the habit of success has already been established among college students and the general efficiency of their methods of work is further indicated by the number of credit points that were made by our various freshmen groups, and negatively by the number of hours of academic work in which these students failed.

The fact that the students who are obliged to do some outside work to help make their way through college are enrolled in fewer hours of work and that they still make, if taken as a group, as many credit points as the students who do not have to do any outside work, is evidence that they have developed more effective methods of work. They are succeeding better with their academic work when as a group they rated lower on the intelligence test, showing that the habit of success has been more firmly established among the members of this working group. These

facts are shown by the data presented in Tables XXIX and XXX. The non-working girls make a few more credit points than those compelled to do some outside work, but a much larger percentage of the working boys and girls completed *all* their enrollment in a way that was satisfactory to their instructors, than was the case for the non-working groups. This is clearly shown by the data given in Table XII, page 52.

It is also true that the working students spend less time on the study of their lessons than do the non-working freshmen. But they make fewer failures and make practically the same number of credit points. They are enrolled in about the same number of hours of academic work and spend much time working on the outside, as has already been shown in tables which precede. We conclude that the working students, because of necessity or for other reasons, have developed more effective methods not only of conserving their energy and time, but of doing their work.

(3) *Number of Hours of Academic Work in Which a Failing Record Was Made.*—A study of the grades which these freshmen students made in their first semester revealed the astounding fact that only 46 per cent of the boys and 63 per cent of the girls completed all the work in which they were enrolled, in a manner that was satisfactory to their instructors. The extent of this failure is indicated by the data

TABLE XXIX.—MEDIAN NUMBER OF CREDIT POINTS EARNED
IN THEIR FIRST SEMESTER BY WORKING AND NON-WORKING
FRESHMEN

Groups compared	Median credit points earned in first semester		Cases	
	Boys	Girls	B.	G.
Those working.....	14.64	17.50	312	206
Those not working.....	14.67	20.91	170	207
Those working 1-3 hrs. per wk...	15.00	17.00	45	65
Those working 4-6 hrs. per wk...	14.50	18.50	60	37
Those working 7-9 hrs. per wk...	14.87	17.67	107	54
Those working 10-30 hrs. per wk.	14.18	17.12	126	75
Those working 31-60 hrs. per wk.	14.50	17.00	33	13

TABLE XXX.—PER CENT OF FRESHMEN STUDENTS WHO
CARRY A LIGHT AND A HEAVY ACADEMIC LOAD

Per cent enrolled	Hours of enrollment											
	8-14		15		16		17		18-21		Cases	
	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.
Working students.....	2.9	7.0	9.3	6.4	67.6	71.4	19.7	12.8	.6	2.0	310	207
Non-working students	1.7	2.0	2.9	2.8	58.3	77.0	36.4	15.7	.6	2.8	178	209

contained in Table XXXI which gives the per cent of freshmen who failed in a few, and in all the hours in which they were enrolled. Our distribution tables and correlation surfaces showed that some of these students failed in all the courses in which they were enrolled. Some boys failed in 17 hours of work. The largest number of hours of failure made by the girls was fifteen. Such failures are evidence not only of poor and inefficient methods of work but of the habit of failure, of a wrong attitude towards their tasks, and other factors, perhaps, which should be determined and assigned to their proper place among the causes of academic failure among college students. The case here is the same as with a student's inability to read. No corrections for such human waste can be made until the causes of the failures are more definitely known.

TABLE XXXI.—PER CENT OF FRESHMEN STUDENTS WHO FAIL
 IN THE FEWEST AND MOST HOURS OF WORK

Groups compared	Hours failed the first semester							Per cent who withdrew
	0	1	2	3	4-5	6-8	9-17	
Boys.....	46	5.1	6.4	6.6	7.9	8.9	11.2	8.0
Girls.....	63	6.1	4.5	4.2	6.1	6.6	6.1	3.0

2. USE WHICH COLLEGE STUDENTS MAKE OF THEIR BEST PERIODS FOR STUDY AND WORK

Another factor which indicates the character of the methods of work now used by college students is the use which they make of their best periods for study and work. All our subjects were asked if there were certain periods in the day during which they could do more and better work than at other times. A few of the students, less than two per cent, did not answer the question. Most of them, 78 per cent of the boys and 80 per cent of the girls, stated that they had noticed certain periods in the day when they could do more and better work, or do their work more easily than at other times. Nearly all of these students, 89 per cent of the boys and 92 per cent of the girls, knew just when these periods came or when, as they said, they could release their energy more easily and direct it more successfully towards the things they wished to do. For 51 per cent of the girls this time came in the forenoon, for 9 per cent it was in the afternoon, for 25 per cent it was at night. In the case of the boys, 38.1 per cent said their most favorable time for work was in the forenoon, 7 per cent located it in the afternoon, and 23 per cent at night. The rest did not know.

What was most interesting about these answers, is the fact that so large a percentage of the students, 89

per cent of the boys and 92 per cent of the girls, located these periods definitely as to clock hours and knew about how long they lasted. It is also important to note that they lasted from one to five hours for different students, depending, it would seem, upon the individual's power to resist fatigue.

But notwithstanding this definite knowledge on the part of large numbers of students our personal interviews with these students and a study of their methods of work showed conclusively that only an occasional student made any definite use of this knowledge, either in planning their work or in arranging the sequence of their tasks. In other words, college students do not plan their work so that the most important or difficult tasks are performed when they can do their best work. Neither have they learned how to take advantage of the principle of "warming up" or of the other physiological and psychological factors that favor the release and control of human energy.¹ Few college students have learned how to get hold of the powers that lie within them, or how to work *with* nature rather than *against* it in accomplishing their aims. Much advancement could, therefore, be made by way of improving their methods of work, if only these students were shown how to make the best possible use of the mental abilities and powers which they possess.

¹ Compare W. F. Book "Learning How to Study and Work Effectively" Chapter V, Ginn & Company, Boston, 1926.

3. OTHER FACTS ABOUT STUDENT METHODS OF WORK

Many other facts were determined which indicate a lack of efficiency in the working methods of college students. One of these is the general character of the working schedules which these students made out for the writer in the present experiment. These clearly showed that most college students do not have any regular plan for their work. Many did not know how they spent the time that was not planned for them, like going to laboratory or class. It was found that extraneous circumstances determined very largely what they would do at certain times of the day. In some cases the matters of sleeping and eating were not even standardized, and no planning at all was done in connection with specific tasks.

Much about their methods of work was also learned from our distribution tables and correlation surfaces which showed how each student spent his total available time. These data showed that only a few freshmen students had a definite plan of work for the entire day. This means that instead of preparing their work at a definite time each day and doing their work on time, they would neglect it from day to day and try to make up for lost time when a test had been assigned or when some term paper was due.

It was also found that these students prepared their assignments in the same general manner that they

proceeded during the day. As a natural result, they were seriously handicapped when it came to getting their facts. Moreover, the same inefficiency of procedure showed up when it came to interpreting what they read or preparing an assignment which required them to organize and use the facts obtained from their reading. Here they proceeded in the same inefficient way which characterized their other work, completing a vicious circle that could result in nothing else but inefficiency, loss of interest, and failure in their academic work.

There is need, therefore, for showing college students just how their methods of work may be improved, for demonstrating to them that such improvements can be made, and for interesting them specifically in making further and continued gains in this direction. If this much were done, their most serious difficulties would be located and marked improvement would be made in their methods of work.

CHAPTER XII

WORKING LOAD OF COLLEGE STUDENTS AND ITS ADJUSTMENT TO THE FACTORS WHICH CONDITION INDIVIDUAL SUCCESS

1. WORKING LOAD OF VARIOUS GROUPS OF STUDENTS COMPARED

Notwithstanding the marked individual differences in mental ability, past successes, motives, and attitude towards their tasks, which exist among college students, almost no variations were found in the academic load or enrollment of freshmen students. It was found that even those who are compelled to work their way through college, if taken as a group, carry as many hours of academic work as those who do nothing but their university work. For example, two boys who were spending 65 to 70 hours per week respectively on outside work were each enrolled in 16 hours of academic work, and two other boys enrolled in 17 hours were each working 55 hours per week in addition. Only nine freshmen boys who did outside work this

year were enrolled in less than 15 hours of University work. The least number of hours in which any of the men who did outside work were enrolled was eleven hours in the case of one man. The other eight working boys who had less than the usual academic load were each enrolled in fourteen hours.

The situation for the girls is much the same. Only 14 girls who did outside work were enrolled in less than 15 hours. But the girls put in much less time on outside work than the men. Only 13 freshmen girls were this year working more than 30 hours per week during the first semester. These were all enrolled in 15 hours or more of academic work.

Some of these facts were earlier set forth in Table XXII, which compares the enrollment or academic load of the students who work on the outside with the enrollment of the students who do not have to do any outside work. As the table shows, there is little difference in the academic load carried by students who work and by those who do not. Moreover, many students choose or are compelled to do a great deal of social and committee work in the various student organizations on the campus. This invariably adds to their regular load since no provisions are made for such duties when the students' enrollments in the University are made out.

The tables and data presented in Chapter VII of this report further show that no consideration is given,

when the student's working load is determined, to his mental ability or to variations in the mental strength found among the individual students belonging to our several student groups. Table XX gives the enrollment of the students who ranked at various levels on the Intelligence Test. And as may be seen by a study of the data contained in this table, the students who rank at the lowest levels on the Intelligence Test are enrolled in as many hours of academic work as are those who ranked at the highest levels on the test. Moreover, no consideration is given to these variations in mental equipment, either by the students or faculty, when the amount of outside work that is to be undertaken is determined. It will be found by a study of the data earlier presented in Tables XXI and XXII that the students who ranked at the lowest levels on the Intelligence Test are doing as much or more outside work, and are enrolled in as many hours of academic work as are the students who ranked at the highest levels on the Intelligence Test.

It was further determined, as has already been set forth in Chapter VIII, that no consideration is given, when a student's working load is determined, either by himself or by his university advisors, to his ability to read. Those who ranked at the lowest levels of achievement on our reading tests were found to be attempting the same amount of work and in many individual instances were enrolled in more hours of

university work than was the case for the students who possessed the greatest skill in reading.

It was further determined that in the case of all freshmen students, no consideration, whatever, is being given, when their working load in the University is made up, to the habit of success which these students have already established, as indicated by the character of their high school record or other successful achievements.

It was also found, as pointed out in the preceding section, that the students enrolled in the most hours of work were succeeding relatively better than those enrolled in the fewest hours of academic work. This was shown by the fact that they made more hours of credit per semester and more credit points than those enrolled in fewer than the normal number of hours of academic work. We also found a lower percentage of failures among the group of students who were enrolled in the largest number of hours than were found among the students enrolled in less than the normal amount of academic work. A rule of the University prevents an *upper classman* from enrolling in more than the average number of hours of academic work if his previous record shows that he has failed in some of his work. That is to say, he may take extra work if he has made more than an average grade in all his courses the previous semester. But no adjustment whatever is made in the case of freshmen students

whose habit of success or failure is not taken into account in determining his working load in the University during the first semester. This fact helps to explain why it is so difficult, as a rule, for freshmen students to orientate themselves to their work in college during their freshman year.

The working load of different groups of students, together with the facts presented in other chapters of this report, therefore show the adjustments that are being made to this and the other important factors which determine a student's success with his college work. For example, no consideration whatever is given to their present methods of work. The brightest students are not required to take any more work than those rating at the lowest levels on the Intelligence Test, nor are these brighter students expected by their instructors to do a superior quality of work. Little attention is also given to the physical condition and health of these students when their working load is decided upon. Their endurance and power to recuperate from the effects of their work is not even considered. And no consideration is given to the ideals, mental attitude, interests and motives which are stimulating and directing the activities of these students. In fact, no counsel is given in regard to any of these factors nor is the student given any information in regard to the role which such factors play in the determination of his success.

2. NEED FOR A BETTER ADJUSTMENT TO THE FACTORS WHICH DETERMINE INDIVIDUAL SUCCESS

These facts make it clear that a much better adjustment of the student's working load should be made to the factors which help to determine his academic success—first to his mental ability and to differences in mental strength as revealed by the data presented in Chapter VIII. This is perhaps the greatest single factor determining the success which a student will make with his academic work.¹ A student should in fact be commended when he does a grade of work that is somewhat commensurate with his mental equipment or ability to learn.

A student's working load should also be adjusted to his methods of working or to the degree of success that has already been attained. If such an adjustment be not made, a habit of failure is very likely to be established which paralyzes interest and effort and is ruinous to future success. But if a student is in the habit of succeeding with all his work, he can to advantage take on a relatively heavy load. If the habit of success has not been developed, his working load must be correspondingly decreased.

The writer had an experience with a very bright student some five years ago who illustrates the point.

¹ Compare the Study by Mays on Predicting Academic Success. *Jr. Ed. Psychology*, Vol. 14, pp. 429-440.

As a freshman he was failing in every course in which he was enrolled. This student really meant to do his work and desired very strongly to succeed both for his own sake and to please his parents, of whom he was very fond. Thinking that he could be helped, the writer became his faculty advisor and responsible for his success to the committee, which had decided to dismiss him from the University because of failure to do his work. To give him some of the assistance he needed, his working load was lightened and a careful plan worked out in cooperation with the student, which included the special privilege of working in a private room at the library. A schedule of work was also made out to economize his time. This schedule showed when he was to study each subject, take his recreation, and do everything he had to do. After it had been made and tested, he said he was very sure he could carry out this plan of work if given a chance, and he made solemn promises that he would do so. By special arrangement his instructors only required him to do his daily work and gave him plenty of time to make up his back work; but he failed utterly to make good because the habit of failing had been so thoroughly stamped into the reactions and life of this young man, and because his mental attitude towards his work and towards his ability to succeed was so unfavorable that he failed utterly to carry out his plan. He continued to fail in his work and was

dismissed from the University at the end of the semester.

This instance is only one of many which might be cited to show that if a habit of failure has been established by a student, his working load must be carefully adjusted to his ability to succeed. Most freshmen students need some definite help along this line to enable them to succeed with their work.

In determining his working load a student should also take account of the character of his ideals, his interests, motives, and the strength of his desire for their realization, since these are the driving and directing forces in his work and life and therefore have much to do with the general character of the success which he will be able to attain.

In deciding upon his working load, some consideration should also be given by the student to his ability to read, because this is a dominant factor in any student's success since he must secure about 90 per cent or more of his facts from reading and the study of books. One's outside duties are also a factor in determining his success and should be taken into account in deciding his working load because these extra tasks consume both time and energy and will make failure sure unless a proper adjustment is made to this group of facts or a marked improvement in one's motives and methods of work. One freshman student this year was enrolled in 17 hours of work.

He was working 60 hours per week on the outside and ranked at the 12th percentile level on the Intelligence Test. He soon became very much discouraged and failed utterly in his work, dropping out of the University before the middle of his first semester.

One's working load should also be adjusted to his physical condition and health, so that he will not break down or injure his health, or be compelled to go to a hospital to finish his education in these fundamental respects. Some attention should also be given to the objective conditions under which a student must work, since all stimuli affect the worker's reactions helpfully or hurtfully, and if unfavorable, consume some of the energy that should go into the performance of his tasks.

3. KIND OF HELP WHICH COLLEGE STUDENTS NEED TO IMPROVE THEIR METHODS OF WORK

Most college students, particularly freshmen, need therefore to be helped to adjust their working load to the factors which determine their individual success. They should be shown how to proceed to improve their methods of work. They should know their mental and physical handicaps as well as their points of strength so that a proper adjustment might be made in their own individual case. They should be instructed how to determine the extent to which the

habit of success has already been established in their own life, and helped to determine the relative efficiency of their own methods of work. They should be shown how to measure their ability to read, and how to proceed to learn to read more effectively and rapidly, because success in their work is so largely determined by how poorly or well they can do this type of work. They should also be shown how important it is for them to keep themselves physically and mentally fit for their work, and helped to establish the habits which alone result in the type of living and work that will enable them to achieve the desired result. They should be shown how to develop proper ideals, how to strengthen their interests, and how to coordinate their purposes not only while at work, but throughout their life. These and many other types of instruction would enable a student to improve his methods of work and give him the assistance he needs to establish the habits of thought and work which alone will insure the highest type of personal success.

PART III

RESULTS OBTAINED IN A SPECIAL “HOW TO STUDY” COURSE GIVEN TO COLLEGE STUDENTS

CHAPTER XIII

WHY SPECIAL REMEDIAL INSTRUCTION IS NEEDED BY COLLEGE STUDENTS TO LEARN HOW TO STUDY AND WORK EFFECTIVELY

Acquiring more effective methods of work is a case of individual learning where the persons making the improvement may be greatly assisted if given the right kind of direction and help. If a person is capable enough, or if a strong enough desire or actual necessity exists for making such improvements, the individual will make marked and more or less continued gains in most or all of the lines of improvement suggested in this report, and without any special direction or assistance being given him from the outside. But as in every case of learning, a learner in this field can be materially helped by the advice and direction of someone who knows exactly what must be done to make the greatest amount of improvement in this type of learning; someone who knows what things should be done first, what second, and what later or last; someone who knows from

experience or training how each necessary thing can best be done; who knows the difficulties which this type of learning normally presents to the learner and how these difficulties may best be avoided or overcome; someone who can give the learners aid in checking up on the accuracy of their work and help them to measure their success as they learn to do these necessary things.

For the same reasons that we do not require or expect a prospective physician or lawyer to master unaided the lore and skill in his profession, we should not expect college and high school students to learn by sheer experience or by the trial and error methods used by the race to make its slow and laborious advancement in every field, how to conserve their energy and time, or how to use both most effectively when confronted by their tasks. We should not expect them to learn unaided how to make the right use of ideals or specific purposes and plans, how to make an effective analysis of their tasks to find the best way of performing them, how to master the higher phases of the art of reading, or even to make the conditions under which they must work most helpful for the things which they have to do.

In mastering these and other problems pertaining to this important instance of learning, students need constant direction and expert help. Such help can be given, and represents in the opinion of the writer

one of the most valuable phases of a college education. If every teacher had these helps more definitely in mind and would carry on his instruction in a way that would lead his students to do their work in the proper way, instead of being most interested, as he usually is, in their mastery of the subject he teaches, regardless of how it is learned or of the attitude of mind and the habits of thought and work that are acquired in the process, specific help along these lines would not need to be given in a special "How to Study" or "Orientation" course. But such is unfortunately not the case. Special help in learning how to work at one's tasks in the most effective way should, therefore, be given to most college students in order that they may learn how to apply themselves more effectively to their tasks, and learn how to develop the habits of thought and work which alone will enable them to make the most of their abilities and powers.

This conclusion is forced upon the writer by the facts which precede. But such habits of work can not be incidentally acquired. They must be established by getting the student definitely interested in the problem of making improvements along these lines and by giving him the encouragement and help which he needs to establish the particular habits that give him the ability to deal with all his tasks in the most effective way.

There is need, therefore, for a new type of instruction, one which will give college and high school students concrete help along all these lines. Most college students need to be helped in adjusting their working load to the factors which in reality determine their personal success. They must be helped to determine their mental and physical handicaps as well as their points of strength. For without such assistance a proper adjustment in these respects can not be made. Most college students need also to be shown how to determine for themselves the extent to which the habit of success has already been established by them, and helped so they may determine the relative efficiency of their own methods of work. They need to be shown how to measure their ability to read and how they must proceed to learn to read in the most effective way. They need to be shown how important it is to keep themselves physically and mentally fit for their work, and helped so they will establish the habits of thought and work which alone make possible a type of living and work that will enable them to achieve the highest type of personal success. They need also to be shown how to develop proper ideals, how to strengthen their interests in the things they have to do,¹ and how to coordinate their immediate and ulti-

¹ See Wm. F. Book, "How to Develop an Interest in One's Tasks and Work." *Journal of Educational Psychology*, Vol. XVIII, January, 1927, pp. 1-10.

mate purposes and plans. Such instruction and guidance would give college students the assistance they need not only to succeed with their work but to establish the particular habits of thought and work which alone will insure their personal success in college and in later life.

That many college and university students are unable to succeed with their work in a way that is satisfactory to their instructors, and that they have great difficulty in orientating themselves to the life and work of a college or university, is generally known. At Indiana University, for example, only about half of the freshmen students who entered the university last year (1926-27) completed their total enrollment during their first semester, in a way that was satisfactory to their instructors. Many failed in all the courses in which they were enrolled; sixteen per cent of the 1200 entering freshmen failed in about half the courses in which they were enrolled during their first semester in college. It is the practice, in fact, of many universities to dismiss from one-fifth to a third of its freshmen students each year because of their failure to do their college work.¹

That special direction and supervision of the efforts and work of college students is needed is further demonstrated by the fact that most colleges and universities have found it necessary to organize a

¹ Compare on this point this study, Chapter XI.

special Orientation or "How to Study" course to give their freshmen students some such type of instruction as is indicated in this chapter and book. That there is great need for such remedial instruction and specific personal help is also demonstrated by the marked development that has taken place during the past five years in the personnel work done in the colleges and universities of the country.¹ That most of the failures of college students are due to remedial causes² and that a type of instruction can be given that will enable them to learn to do their work in a more successful way has also been demonstrated by the experimental work done in the Orientation and "How to Study" courses recently organized in the high schools and colleges of the country and by the studies that have been made of the working methods of college students.³

These experiments and studies have clearly shown that acquiring more effective methods of study and of doing other types of work is, in reality, a case of learning where the persons making the improvement may be greatly helped if given the right kind of

¹ See Wm. F. Book, *Need for a New Type of Educational Personnel*, *Journal of Personnel Research*, 1927.

² Compare Wm. F. Book, *How Well College Students can Read*, pp. 242-248, *School and Society* Vol. XXVI, August 20, 1927.

³ Compare next Chapter in this book. Also Wm. F. Book, *School and Society* Vol. XXVI, August 20, 1927, pp. 242-248.

assistance. It has, therefore, been the purpose of the present study to secure facts that would help us devise a method and technique for giving college and high school students some definite help along these lines. To learn how to give such remedial instruction was also the incentive for the organization of a special "How to Study" course at Indiana University, which has as its chief purpose the development of a greater interest in this type of learning, and the giving of concrete help along these lines to every student enrolled in the course. In this special "How to Study" course some important practical results have already been obtained during the past three years. A few of the more outstanding results already achieved will be presented in the next chapter.

CHAPTER XIV

RESULTS OBTAINED IN A SPECIAL "HOW TO STUDY" COURSE CONDUCTED AT INDIANA UNIVERSITY¹

1. LEARNING TO CONSERVE ONE'S AVAILABLE TIME

As shown in Chapter III of this report, the average freshman student wastes about four and one half hours per day or loses this much time because he has not learned how to plan his work and how to plan for the right use of his available time. Our data further showed that the methods of work of a more select group of 496 upper classmen whose methods of work were also studied were but little more efficient in this respect, since the students belonging to this selected group were still wasting on the average about three and one half hours per day.

Our classes in the "How to Study" course were, therefore, shown how to make an effective working schedule, one that would enable them to utilize all their

¹ Reprinted by permission from *School and Society* for October 22, 1927.

available time. They were also shown how to plan for a more profitable use of their total time. It was found by the results of an exact experiment conducted by the writer in a class of 24 freshmen and sophomore students, many of whom had been failing in their work, that these students were using on the average only 76 per cent of their available time in a way that was judged to be profitable by them.¹ The members of another section composed of 33 more advanced students were more efficient in their ability to use their total time. The efficiency of the latter group in the use of their available time averaged 84 per cent before the instruction began. After giving both classes definite help and some practice in planning their work, and in making a working schedule, showing them just what they must do to make a successful and workable plan for using their total supply of time, and showing them what they had to do to carry out such a plan, the increase in their ability to make a more profitable use of their total time rose from 76 to 96.3 per cent for the college class, and from 84 to 98.1 per cent for the class of older men and women.

Some individual students were, of course, found to be already efficient in this respect. Others were wasting more time than they profitably used. The

¹ For experiment and method of measurement used see W. P. Book, "Learning How to Study and Work Effectively," Ginn & Co., 1926, especially, pp. 33-39.

best part of the experiment was that it revealed to each student not only how inefficient he was in this respect, but how or why this amount of time was lost. It also showed them just what had to be done to make further progress in this factor of individual success.

The habit of planning one's work, and the habits involved in the execution of one's plans, can, of course, not be established during one semester. But the following definite results were achieved: a genuine interest in this element of personal efficiency was aroused; a marked and measurable amount of improvement was made; a method was given to each student that enabled him to measure his own efficiency in this respect and to determine by objective measurement just how much progress he had made to date and how inefficient he still remained in his ability to use his total time.

2. IMPROVEMENT MADE IN LEARNING HOW TO READ

The students in four classes were also shown what they must do to learn to deal more successfully with certain typical tasks which they had to perform over and over every day, such as learning to read more effectively and rapidly, how to memorize facts in the most economical way, and in a way that would enable them to apply this knowledge in their thinking and work; how to make a systematic investigation of a particular subject or problem and how to organize the

results of such a study into a finished report; lastly, how to apply themselves more completely and continuously to their tasks as they worked.

It was early discovered that most students taking part in our experiment did not know how to get from a printed page what the author had said or what a student must get if he is to succeed with his work. That is to say, most of these students had not learned how to read, taken in its broadest and real sense. As earlier pointed out¹ one bright student, rating at the 76th percentile level on the Intelligence Test, had mastered only 32 per cent of the contents of a well written chapter in one of his texts, after he had studied it one hour and a half. It should have been mastered by a good reader in 35 or 40 minutes. Another student in the same class, ranking at the 74th percentile level on the Intelligence Test, was 7.2 times as efficient in his reading as the former student when measured by two standard types of reading test. In another class taught by the writer the readingability of the best student in the class was 17 times as great as that of the poorest reader in the class. Some college students have learned to read fairly well, but most of them are very deficient in this art. The average ability of the entire freshmen class entering Indiana University in the fall of 1926 was only about

¹ For results on freshmen students' ability to read see Chapter VIII of this report.

half what we might expect it to be. In fact, they were found to be able to get only 32 (the boys) and 43 (the girls) per cent of the points made by the author in the standardized assignment which they read. And the students enrolled in our "How to Study" classes were only a little more efficient in their ability to read.¹

After these students had been instructed in the "How to Study" class on what they must do to improve their method of reading, and after some practice in the method had been given them, the reading ability of the students taking the course was increased 102 per cent. In the case of some students, their reading efficiency was improved 250 per cent by the instruction, which consisted in part of applying the suggestions given to the preparation of lessons assigned by their instructors during the time that help on this problem was given. The actual improvement made in learning how to prepare a standard assignment in a text averaged 37.3 per cent per pupil, while the ability to read more rapidly and accurately was improved 102 per cent for the classes taken as a whole.²

Less formal instruction in learning how to read was given by the writer to two Educational Psychology classes composed of 114 students. The improvement made by these students nearly equalled that obtained in the special "How to Study" classes, demonstrating

¹ Compare Section One of Chapter VIII.

² See data given in Table XXV of Chapter VIII.

that helpful instruction in learning to read more effectively and rapidly can be given to college students.

3. IMPROVEMENT MADE IN LEARNING HOW TO PLAN AND DO ONE'S WORK MORE SUCCESSFULLY

Successful planning of one's work consists (1) of listing the things to be done during the time for which the plan is made and arranging these tasks in the order in which they are to be taken up; (2) making a study of each task with a view of ascertaining how it can best be done and the time that will be required for its performance; (3) making a schedule embodying these items or a detailed plan which will show when each task is to be begun and how much time is to be allotted to its performance; (4) making arrangements for carrying out this plan which should include: (a) securing the needed equipment and tools, (b) making all objective and psychological conditions as favorable as possible for the accomplishment of these tasks, (c) preparing a set of definite instructions or a plan for carrying out one's plan; and lastly (5) carrying out this detailed plan as you have made it.

Some planning must, of course, be done by every student or person who accomplishes any kind of work. But there are many grades of planning done by the workers of the world. Those who accomplish the most make the best plans and the best provisions for

carrying out their purposes and plans. Efficient planning and the ability to carrying out one's plans is, in fact, the most important single factor in successful work of every sort. But college students were found to be woefully deficient in these respects.¹ Instead of their energies being directed by a concrete and well-defined plan, instead of being constantly spurred on to greater and continued endeavor by the items in their plan, until their purposes have been successfully carried out, their behavior, while at work, is mainly controlled by chance stimuli or by the circumstances which surround them at the time. This causes gross inefficiency in their accomplishments and much waste of their energy and time.

Definite and continued help was, therefore, given in our "How to Study" classes along these lines. The students were shown the need for successful planning and the personal value which comes from a well thought out and workable plan. They were shown how a successful plan for any task and for a larger undertaking must be made. They were convinced that to make a successful and workable plan for their work, they must make it a point to study their tasks to determine how each can best be performed; and by actual experiment and investigation they were lead to discover for themselves not only how each thing could best be done, but how much time was needed

¹ Compare Section 3 of Chapter XI of this report.

for its performance. Various aids to the successful dispatching of a plan were also pointed out and the principle of planning in all its phases gradually applied to their daily tasks and university work, so that actual practice was given to the specific habits that must be established in learning how to plan one's work in the proper way.

That real progress was made in learning to plan their work and in establishing the habits that enabled our various student groups to work at their tasks in a more effective way, is shown by the marked improvement made in learning to do their university work in a more successful way. Former failures were turned into successes. More credits and credit points¹ were made by the same students after the instruction and practice in planning was given them than they made before. They became more interested in their work and in learning how to improve their methods of work. One student who enrolled in the How to Study course in the second semester of his sophomore year had made nothing higher than a C+ in any of his work with a goodly sprinkling of D's. In the next semester his grades were mostly B's and A's and his senior year he made nothing but A's. He attributed this success largely to the help he secured in the "How to Study" course. Another student who had to work his way

¹ For an interpretation of term "Credit Points" and the marking system used at Ind. Uni. see Chapter XI, Section 1 (2).

through college increased his earning power after taking the course from \$10.00 per week to \$17.50. He added one and one half hours to the time devoted to sleep each day, increased his enrollment three hours and made B+ or A in all his university work. This increased efficiency he attributed entirely to the help he secured in the course, in learning to plan his work, and to the interest which it aroused in him in improving his methods of work.

4. GAINS MADE BY VARIOUS STUDENT GROUPS IN THEIR ABILITY TO SUCCEED WITH THEIR ACADEMIC WORK

The actual gains in academic success made by the various student groups who were enrolled in our "How to Study" classes during the past school year (1926-27) are given in Table XXXII. As may be seen by reference to the table, marked gains in ability to do their college work were made. And it should be remembered that about half of the students enrolled in this "How to Study" course last year were sent into these classes by the Deans because they had been failing in most of their work. This greatly decreased their chances for success. The remedial instruction on learning how to study more effectively should be given not to students who are failing in their work, and who, therefore, have already established a habit

of failure, but to students who really want to improve their methods work. It is very difficult to help students who have already developed the habit of failing with practically everything they have attempted to do. But very decided improvements were made by all our sections as the data contained in Table XXXII will conclusively show.

A glance at this table will show that the four classes who took the work as a regular two hour elective course made an average of one more credit and 4.17 more credit points per pupil during the semester they took the course than these same students had ever made before in any semester. The semester after they took the course, these same 76 students, about half of whom had been sent into the class by the Deans because they had been failing in their previous work, made an average of 6.46 more credit points per pupil. In one of the sections, half of the class were chronic failures and were on probation at the time. They not only got along well in their work that semester but made continued improvements in their work the next semester. One of the writer's students who had been doing a rather poor grade of work in the three semesters before he took the course, made 41 credit points the semester he took the course, and 44 credit points the semester after he had the course. He had never made more than 18 credit points in any previous semester.

The best results, however, were obtained in the two laboratory classes where this instruction was given throughout the year in connection with their work in Psychology. These two sections contained 67 students and were taught by two different instructors. The first semester after they had begun the work, the 24 upper classmen who were enrolled in the course made an average of 1.8 more credits than they had ever made before in any semester, and 4.63 more credit points per student. In the next semester they did better still, making an average of 6.56 more credit points per pupil than they had ever made before in any semester.

Better results still were obtained by the 43 freshmen students enrolled in these two sections. They made an average of 20.80 credit points per pupil in their first semester. The average number of credit points made by the entire freshmen class last year in this same semester was 16.01. In the second semester these same 43 freshmen made an average of 23.65 credit points per student, which was 7.78 credit points better than the record made by all freshmen students in the university in the same semester. There was also a marked improvement over the work done in their first semester.

What is still more significant, perhaps, is the fact that 87 per cent of the freshmen students enrolled in these two "How to Study" sections completed their

total enrollment in the university in a way that was satisfactory to *all* their instructors, while only about half of the freshmen students entering the university last year, (46 per cent of the boys and 63 per cent of the girls) completed their total enrollment in a satisfactory manner. The average intelligence rating of this group of 43 freshmen was no higher than for the entire freshmen class.

These and other facts are shown by the data given in Table XXXII. And it should be added that these

TABLE XXXII.—AVERAGE NUMBER OF CREDIT POINTS MADE BY STUDENTS ENROLLED IN "HOW TO STUDY" COURSES IN 1926-27 COMPARED WITH THE CREDIT POINTS MADE BY ALL FRESHMEN DURING THE SAME SEMESTER

Groups compared	Ave. No. of credit points made in all semesters before, while and after taking the course			Ave. percentile rating of group on Int. Test	Total cases
	Before	During	After		
Four regular "How to Study" classes.....	16.04	20.21	22.50*	50.75	76
Two lab. sections where instruction was spread over 2 semesters. 24 sophomore, junior and senior students...	18.02	22.65	24.58	61.00	24
43 freshmen taking the course..	.....	20.80	23.65	58.39	43
Entire freshmen class in 1st and 2nd semester.....	.....	16.01	15.87	57.00	1176

* Record for 36 students who took the course in the first semester.

results were obtained by three different instructors and before we discovered the serious deficiencies which exist among college freshmen in their ability to read. The best results in a "How to Study" course can not, of course, be secured until we know what sort of help college students need and really must have to make a success of their work.

5. OTHER THINGS TO WHICH THE PRINCIPLE OF PLANNING WAS APPLIED

Marked improvements were also made by applying the principle of planning to the factors which lie at the very basis of a successful and happy life, such as getting the students to plan more definitely for the conservation of their energy and health; to plan for the full restoration of the energy consumed by their daily activities and work; to plan to make a more effective use of the principle of ideals, seeing that a proper coordination is maintained between their more immediate and ultimate purposes and plans; getting them interested in developing a method of work that would insure more definite and continued improvement in this type of learning; in a word, getting them interested in a plan of life and work that would insure the establishment of the particular habits that must be acquired to make one truly efficient in his work and life. Space prevents us from giving examples and concrete data on all these points.

But from the facts already reviewed it is clear that college students need to be helped if they are to succeed with their work and learn to work at their tasks in the most effective way. These data further show that they can be definitely interested in the problem of improving their own methods of work, and that real practical help can be given them. We conclude that a type of remedial instruction something like that described in this book and given in our "How to Study" course should be given, not merely to the students who are having difficulties with their work, but that it should be provided for all who are ambitious to improve their methods of work or who desire to learn to work at their tasks in a more effective way.

If this portrayal of the present methods of work of college students, and this brief account of our experiment with a certain course of instruction which has as its chief aim the improvement of their methods of work, will contribute anything, however, small, to the solution of the many problems in the field of educational personnel and to the specific problem of learning how to acquire more effective methods of work, the writer will feel amply repaid for making this extended study of so complex a problem as the one undertaken in the investigation reported in this book.

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